Public Hearing (8/30/12)
Central Coast Agricultural Order Stay Hearing
Deadline: 8/27/12 by 12 noon

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BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File No. A-2209(b), (d) PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

On August 2, 2012, the State Water Resources Control Board ("State Water Board") issued a Notice of Public Hearing on Stay Request ("Notice of Public Hearing") with respect to Requests for Stay filed by Ocean Mist Farms and RC Farms; Grower-Shipper Association of Central California, Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties, and Western Growers. The Grower-Shipper Association of Central California, Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties, and Western Growers (hereafter, "Grower-Shippers"), and the California Farm Bureau Federation, Monterey County Farm Bureau, San Benito County Farm Bureau, San Luis Obispo County Farm Bureau, San Mateo County Farm Bureau, Santa Barbara County Farm Bureau, Santa Clara County Farm Bureau, and Santa Cruz County Farm Bureau (hereafter, "Farm Bureau") hereby jointly respond to the "Issues to be Addressed" as requested by the State Water Board's Notice of Public Hearing.

I. Costs for Complying With Specific Requirements are Substantial

The Notice of Public Hearing requests that cost estimates and the underlying assumptions for those cost estimates be provided for specific provisions contained in Order No. R3-2012-0011 Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands ("Conditional Waiver"), Order No. R3-2012-0011-01 Monitoring and Reporting Program for Tier 1 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands ("Tier 1 MRP"), Order No. R3-2012-0011-02 Monitoring and Reporting Program for Tier 2 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands ("Tier 2 MRP"), and Order No. R3-2012-0011-03 Monitoring and Reporting Program for Tier 3 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands ("Tier 3 MRP"). (True and correct copies of these Orders were previously attached as Exhibits A, B, C, and D, respectively, to Grower-Shipper Association of Central California, Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties, and Western Growers' Petition for Review and Statement of Points and Authorities in Support Thereof (April 16, 2012) (hereafter, "Grower-Shipper Petition").) In response to this request, Grower-

Shipper and Farm Bureau are submitting concurrently supporting declarations.[1] A summary of the cost estimates provided in the supporting declarations is provided here.

A. Installation of Back Flow Prevention Devices

This requirement applies to growers that apply fertilizers, pesticides, fumigants, or other chemicals through an irrigation system. (Conditional Waiver, p. 19.) Because such devices are already required for chemigation (i.e., the application of pesticides through irrigation systems), this is essentially a new requirement for those that apply fertilizers through such systems. In its *Central Coast Water Board Written Response in Opposition to the Stay Requests by the Petitioners in SWRCB/OCC Files A-2209(B)-(E), July 13, 2012* ("Central Coast Response in Opposition to Stay Requests"), the Central Coast Water Board implies that this subset of growers is relatively small. (Central Coast Response in Opposition to Stay Requests, pp. 19-20.) However, there are relatively few pesticides labeled for use through irrigation systems, thus, it is likely that few growers already have such equipment installed. (See Zelinski Decl., ¶ 6.) Consequently, the cost as applied to growers in the Central Coast with respect to the need for such devices for fertigation may be significant on an individual basis as well as a region-wide basis.

Actual costs are difficult to ascertain at this time because guidance from the Central Coast Water Board with respect to what is required is vague. (Zelinski Decl., ¶ 7; see also Mercer Decl.

[1] See Declaration of Bob Campbell in Support of Petitioners California Farm Bureau Federation, et al. and Grower-Shipper Association of Central California, et al.'s Response to State Water Board's Notice of Public Hearing on Stay Request ("Campbell Decl."); Declaration of Stephen L. Clark in Support of Petitioners California Farm Bureau Federation, et al. and Grower-Shipper Association of Central California, et al.'s Response to State Water Board's Notice of Public Hearing on Stay Request ("Clark Decl."); Declaration of Dirk Giannini in Support of Petitioners California Farm Bureau Federation, et al. and Grower-Shipper Association of Central California, et al.'s Response to State Water Board's Notice of Public Hearing on Stay Request ("Giannini Decl."); Declaration of Lawrence Grice in Support of Petitioners California Farm Bureau Federation, et al. and Grower-Shipper Association of Central California, et al.'s Response to State Water Board's Notice of Public Hearing on Stay Request ("Grice Decl."); Declaration of Michael L. Johnson in Support of Petitioners California Farm Bureau Federation, et al. and Grower-Shipper Association of Central California, et al.'s Response to State Water Board's Notice of Public Hearing on Stay Request ("Johnson Decl."); Declaration of Marc Los Huertos, Ph.D., in Support of Petitioners California Farm Bureau Federation, et al. and Grower-Shipper Association of Central California, et al.'s Response to State Water Board's Notice of Public Hearing on Stay Request ("Los Huertos Decl."); Declaration of Kay Mercer in Support of Petitioners California Farm Bureau Federation, et al. and Grower-Shipper Association of Central California, et al.'s Response to State Water Board's Notice of Public Hearing on Stay Request ("Mercer Decl."); and, Declaration of Lowell Zelinski in Support of Petitioners California Farm Bureau Federation, et al. and Grower-Shipper Association of Central California, et al.'s Response to State Water Board's Notice of Public Hearing on Stay Request ("Zelinski Decl.").

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¶ 6.) Estimated costs will range based on the type of equipment required. If a single check valve is sufficient, costs are estimated to range from $20 to $500 depending on the size needed, or if a chemigation-type valve with electrical interties is needed, costs will range from $100 to $1,000s, again depending on the size of the device needed. (Zelinski Decl., ¶ 9.) These costs do not include installation costs or potential costs associated with a need to design and install a "horseshoe" or the need to rotate a well. (Zelinski Decl., ¶ 10.) One grower has estimated in his declaration that the new requirement will result in him needing to install 38 devices. (Campbell Decl., ¶ 7.) His cost estimate for such devices is between $400 and $600 per device. (*Ibid.*) Using an average of $500, he estimates that such devices alone will cost his operation $19,000. (*Ibid.*) Installation costs are estimated to range between $1,800 and $3,000 per well. (*Ibid.*) Using an average installation cost of $2,400 per well, installation is estimated to be $91,200. (*Ibid.*)

B. Maintenance of Containment Structures

Like with the requirement for installation of backflow prevention devices, there is uncertainty with respect to the Central Coast Water Board's requirements and expectations for compliance with this requirement. The provision in the Conditional Waiver states, "[d]ischargers who utilize containment structures (such as retention ponds or reservoirs) to achieve treatment or control of the discharge of wastes must manage, construct, or maintain such containment structures to *avoid percolation of waste to groundwater that causes or contributes to exceedances of water quality standards*, and to minimize surface water overflows that have the potential to impair water quality." (Conditional Waiver, p. 20, emphasis added.) If the need to *avoid percolation of waste to groundwater* means that containment structures will need to be lined, costs will be very significant for growers in the Central Coast.

Specifically, liner costs will vary depending on the liner used. (Grice Decl., ¶ 8.) Cost estimates for the various types of liners are $0.70 to $1.07 per square foot for HDPE, $4.60 per square foot for bentonite (if materials are available), and $1.50 to $3.00 per square foot for compaction. (Grice Decl., ¶ 8.) Many growers in the Central Coast have significant numbers of

containment structures that collectively constitute significant square footage of land that may need to be lined to comply with this requirement. For example, one grower has calculated the square footage of his "sumps" (tailwater ponds) to equal 939,330 square feet, and his reservoirs to equal 1,603,350 square feet. (Giannini Decl., ¶ 8.) At a range of costs between $0.70 per square foot to $4.60 per square foot, the cost for this grower (assuming that all containment structures would need to be lined) would range from $1,779,876 to $11,696,328. For another grower with an estimated 370,786 square feet, this cost would range between $259,550 and $1,705,615. (Mercer Decl., ¶ 7.) This cost does not include any construction or grading costs that may be necessary to reinforce the containment structures.

C. Maintenance of Riparian Vegetative Cover and of Riparian Areas

Assuming that this requirement does not require growers to install or create new vegetative cover, and that the requirement is to maintain existing riparian vegetative cover (as is indicated in the Central Coast Response in Opposition to Stay Requests), then there are no estimated costs for complying with this provision at this time. (See Central Coast Response in Opposition to Stay Requests, p. 21.)

D. Practice Effectiveness and Compliance Reporting

The Conditional Waiver states that all growers (regardless of tier) must include in their Farm Plan a "description and results of methods used to verify practice effectiveness and compliance with this Order (e.g., water quality sampling, discharge characterization, reductions in pollutant loading)." (Conditional Waiver, p. 22.) The Central Coast Response in Opposition to Stay Requests claims that such costs are "reasonable and minimal," but it provides no actual estimates for meeting this requirement. Dr. Marc Los Huertos has expertise with respect to practice effectiveness in ongoing agricultural operations. (Los Huertos Decl., ¶ 1.) Based on Dr. Los Huertos' experience, determinations with respect to practice effectiveness essentially require academic-style studies that are difficult to implement, and are costly. (Los Huertos Decl., ¶¶ 7-17.) For example, Dr. Los Huertos indicates that a recent 2010 practice effectiveness study for vegetative treatment systems that he performed on three farms, cost an estimated $100,000 per

year. (Los Huertos Decl., ¶ 13.) He also indicated that sampling and analysis costs for such studies are likely to be an estimated $28,640 per year/per practice. (Los Huertos Decl., ¶ 17.) Thus, costs for determining practice effectiveness are not reasonable or minimal.

Further, the Central Coast Response in Opposition to Stay Requests appears to minimize, or fails to understand, the complexities associated with making such practice effectiveness determinations. (Central Coast Response in Opposition to Stay Requests, p. 22.) As indicated by Dr. Los Huertos, such studies require multiple trials, replications, and statistical analysis. (Los Huertos Decl., ¶¶ 7-10.) They also take tremendous planning and complex study designs. Because such studies need to be conducted for individual management practices, they are also likely to disrupt regular agricultural operations, making it difficult for agricultural operations to operate efficiently. (Los Huertos Decl., ¶ 14.) While not estimated, there would be costs associated with interruption to agricultural operations.

E. Groundwater Monitoring

Some growers have selected to participate in cooperative groundwater monitoring programs in lieu of individual requirements. (See, e.g., Tier 1 MRP, p. 9.) Costs associated with cooperative monitoring programs are not yet available. With respect to individual groundwater monitoring requirements, growers in Tier 1 and Tier 2 are required to conduct two rounds of monitoring for one year, and the first round of monitoring must be completed by October of this year. Samples must be then analyzed by a state certified laboratory using U.S. EPA-approved methods. (Tier 1 MRP, pp. 8-9.) Actual sample collection and laboratory analysis costs may vary amongst service providers. An example of such costs is provided in the attached declaration from Stephen Clark, a known water quality expert from Pacific EcoRisk. Based on Mr. Clark's estimates, sample analysis for the groundwater sampling parameters is an estimated $540 per sample, and collection costs for a single event, for one well would be an estimated $1,760. Thus, the groundwater sampling costs to comply with the individual groundwater sampling requirement for Tier 1 and Tier 2 growers (i.e., two sampling events) would be approximately $4,600 per well

for a grower in the Salinas area. (Clark Decl., ¶ 11.) Depending on the number of primary irrigation wells and domestic drinking water wells, this cost may be significant.

Further, of great concern to many growers is the publicly reported nature of this information, once the information is collected. Concerns with respect to public availability of such data on an individual grower basis cannot be quantified as a cost but could result in substantial harm to growers. If the information is used inappropriately to target growers, harm with respect to reputation and/or liability could be substantial.

F. Annual Compliance Form Reporting

Determination of costs associated with the Annual Compliance Form Reporting requirement for Tier 2 and Tier 3 growers has been difficult to ascertain. (See, e.g., Campbell Decl., ¶ 12; Mercer Decl., ¶ 8.) There are a number of different ways that growers might try to estimate costs for this requirement. For example, one grower estimated costs for annual compliance form reporting, determination of nitrate loading risk factors, determination of total nitrogen applied, and photo monitoring by combining them together and determining that it would be necessary for his operation to hire one new full-time person at an estimated $200,000 to conduct, prepare, and track the information associated with these requirements. (Giannini Decl., ¶ 12.) In comparison, another grower separated out this requirement and determined that additional personnel and consultant time would be required to prepare and track the information necessary to comply with the Annual Compliance Form Reporting requirement. (Campbell Decl., ¶ 12.) Based on this grower's approach, he estimated that for his operation (18 farms/ranches subject to this requirement), it would cost an estimated $108,000, which equates to $57 per acre for this one requirement.

Another example of cost associated with Annual Compliance Form Reporting is soil sampling. Under the Conditional Waiver, the Annual Compliance Form Reporting requirement includes reporting for farms/ranches that have High Nitrate Loading Risk to report "[t]otal nitrogen applied per acre to each farm/ranch or nitrate loading risk unit (in units of nitrogen, in any product, form or concentration) including, but not limited to, . . . nitrogen present in the soil,

and nitrate in irrigation water." (Tier 2 MRP, pp. 13-14.) Although reporting of this information is not due until October 1, 2014, it is assumed that growers will need to start collecting such information immediately, or at least beginning in 2013. (Zelinski Decl., ¶ 21; Mercer Decl., ¶ 10.) To calculate this information, it will likely be necessary for growers to track the information on a per planting basis. For one grower with 8,000 acres of vegetables with an average of 2.5 plantings per year, this equals about 20,000 crop acres. (Zelinski Decl., ¶ 23.) To collect soil samples, conduct analysis, and interpret the information for 20,000 crop acres, at an estimated cost of $100 per soil sample, the cost will be $2,000,000 per year, or $250 per acre. (Zelinski Decl., ¶ 25.)

Further, with respect to this requirement and the tracking and reporting of information required by determination of nitrate loading risk factors, and determination of total nitrogen applied, it is anticipated that growers will need to obtain a new database to assist in data tracking and management. As is discussed further below, costs associated with database development for vegetable production are currently speculative because vendors are in the process of evaluating how to develop such databases, and the costs associated therewith. (See, e.g., Mercer Decl., ¶¶ 8-28.)

G. Determination of Nitrate Loading Risk Factors, Determination of Total Nitrogen Applied

Of some confusion associated with these requirements is the reporting unit. Is it per crop, per acre, or is it on a per planting basis? (See Mercer Decl., ¶ 12.) Considering the number of plantings in the vegetable industry, clarifications with respect to this confusion may impact costs associated with compliance. Regardless, good faith efforts have been made to try and quantify costs associated with these requirements. One grower estimates that costs for determining and reporting this information for 300 plantings of 30 plus crops will be $40,000. (Campbell Decl., ¶ 13.) Another grower, as mentioned above, anticipates meeting this requirement by hiring a new full-time person just to assist in reporting and compliance with some terms of the Conditional Waiver. (See, Giannini Decl., ¶ 12.)

Further, tracking and preparing this information for future reporting purposes is going to cost growers resources now to have appropriate database management systems developed for their operations. (See, e.g., Mercer Decl. ¶ 10.) Existing field crop database platforms are too rigid and do not currently account for the complexities associated with vegetable production. (Mercer Decl., ¶ 21.) Based on conversations with various vendors, it appears that database development costs for large diversified operations may vary between $50,000 to $125,000. (Mercer Decl., ¶¶ 26, 28.) These costs do not include internal costs for inputting and maintaining field data but are specifically related just to database design. Thus, at this time, it is difficult to quantify costs associated with determining nitrate loading risk, and total nitrogen applied. Regardless, the costs are substantial and would be incurred immediately.

H. Photo Monitoring

Photo monitoring costs, based on the protocol provided by the Central Coast Water Board, are estimated by one grower to be $60,000, which would consist of hiring a consultant to conduct the work. (Campbell Decl., ¶ 14.)

I. Individual Surface Water Discharge Monitoring and Reporting

The individual surface water discharge monitoring and reporting requirement applies to Tier 3 farms/ranches. (Tier 3 MRP, p. 15.) With this requirement, Tier 3 operations must submit individual Sampling and Analysis Plans ("SAP") and Quality Assurance Project Plans ("QAPP") by March 15, 2013. Once the SAP and QAPP are approved by the Executive Officer, sampling must be initiated by October 1, 2013. According to cost estimates provided by a water quality consultant that is an expert in conducting sampling for agricultural monitoring programs, the cost of preparing the SAP and QAPP for a single operation to meet the requirements as specified in the Tier 3 MRP is estimated to be $28,800. (Johnson Decl., ¶ 14.) Further, sampling and collection costs plus analytical costs for the constituents as required by the Tier 3 MRP are estimated to be $3,263.50 per sampling event for one sample. (Clark Decl., ¶ 5 [analytical costs per sample estimated to be $1,268; and, *id.*, ¶ 6 [sampling and collection costs estimated to be $1,995 per event].) Depending on the number of locations to be sampled, the cost of analytical

services would increase relative to the number of locations, while the sampling and collection costs may not increase as they are estimated on an event basis. (Clark Decl., ¶¶ 5, 6.)

Overall, with respect to the costs estimated for the various provisions identified in the Notice of Public Hearing, the costs are substantial, and once spent cannot be recouped. Should the State Water Board ultimately find on the merits that these provisions are inappropriate, money spent to comply now (and other non-economic harm) cannot be recovered. Conversely, the benefits to the environment that would occur from the implementation of these requirements in the interim while the State Water Board conducts its review are minimal.

II. Environmental Benefits to Be Gained Are Minimal

The provisions at issue in the State Water Board's Notice of Public Hearing are not specifically tied to the improvement of water quality, are impractical and unfeasible to implement, and will subject growers to unnecessary costs and exposure to legal liabilities while the State Water Board conducts its review of the underlying petitions. Further, these requirements are not supported by findings that would indicate the environmental benefits associated with each requirement. Findings are required to bridge the analytical gap between the evidence and the requirements in the Conditional Waiver. (*Topanga Assn. for a Scenic Community v. County of Los Angeles* (1974) 11 Cal.3d 506, 515 (*Topanga*) [findings must "bridge the analytical gap between the raw evidence and the ultimate decision or order."]; see also *In Re Petition of the City and County of San Francisco, et al.* (Sept. 21, 1995) State Water Board Order No. WQ 95-4, pp. 10, 13.) Although the findings are numerous, they are not supported by substantial evidence in the record (*Topanga*, pp. 514-515), are broad and generic, and do not actually explain why the requirements in the Conditional Waiver and MRP Orders are appropriate or how such requirements will benefit the environment.

The lack of environmental benefit associated with the various requirements is further explained here.

A. Annual Compliance Form Reporting

The Conditional Waiver requires Tier 2 and Tier 3 growers to submit an Annual Compliance Form "by October 1, 2012 and updated annually thereafter by October 1." (Tier 2 MRP, Part 3, p. 12; Tier 3 MRP, Part 3, p. 12.) Specifically, the Annual Compliance Form includes, but is not limited to: identification of the application of any fertilizers, pesticides, fumigants, or other chemicals through an irrigation system, proof of proper backflow prevention devices, description of method and location of chemical applications relative to surface water, Nitrate Loading Risk factors; and, for dischargers meeting the criteria or designation as Tier 2 and that have farms/ranches that contain or are adjacent to a waterbody impaired for temperature, turbidity, or sediment photo monitoring to document conditions of streams, riparian, and wetland area habitat. (Tier 2 MRP, pp. 11-12; Tier 3 MRP, pp. 12-13.) Although the Conditional Waiver requires the submittal "in a format specified by the Executive Officer" by October 1, 2012, the electronic format for reporting has not yet been provided by the Central Coast Water Board. (*Ibid.*) Further, the language provided in the MRP is too vague to understand the amount of detail required to comply, nor does the provided language correlate to improvements in water quality or the environment. For example, one provision requires the: "Identification of the application of any fertilizers, pesticides, fumigants or other chemicals . . . and proof of proper backflow prevention devices." This language is overly broad and provides no guidance as to what information is required or the need for such information. In addition, other requirements indicate that significant additional research will have to be done to fill out the Compliance Form; for example, "Information regarding type and characteristics of discharge (e.g., number of discharge points, estimated flow/volume, number of tailwater days)." To prepare the information that is required by the Annual Compliance Form, growers will likely need to prepare databases to retain the information, and conduct research. However, collection of such information is unlikely to provide environmental benefit during the time period that the State Water Board would conduct its review of the underlying petitions.

B. Determination of Nitrate Loading Risk Factors, Determination of Total Nitrogen Applied

The MRPs for Tier 2 and Tier 3 operations allows Tier 2 and Tier 3 dischargers to calculate the nitrate loading risk by one of two methods: (1) a Central Coast Water Board staff developed methodology contained in Table 4 of Tier 2 MRP and Tier 3 MRP (Table 4); or (2) the Nitrate Groundwater Pollution Hazard Index developed by the University of California Division of Agriculture and Natural Resources ("UCANR"). (Tier 2 MRP, p. 11; Tier 3 MRP, p. 11.) Based on the determined risk from these methodologies, Tier 2 and Tier 3 farms/ranches must report the information and may then be subject to additional requirements.

Reporting a nitrate loading risk factor itself is of very little to no value and will not benefit the environment. Further, the methodologies set forth for determining nitrate loading risk in the Conditional Waiver and the MRPs are flawed, thus their relationship with respect to providing environmental benefit is also suspect. (Zelinski Decl., ¶¶ 14-20.) For example, the methodology set forth by the Central Coast Water Board in Table 4 is not consistent with the nitrate Hazard Index Concept developed by the UCANR. It identifies three criteria for determining nitrate loading risks. (Tier 2 MRP, pp. 21-22; Tier 3 MRP, pp. 21-22.) The three factors include crop type, irrigation system type, and irrigation water nitrate concentration. Missing from the Central Coast Water Board's criteria is a criterion related to soil type. (Zelinski Decl., ¶ 15.) As indicated in testimony, the elimination of soil is contrary to any appropriate approach for determining risk.

> [DR. LETEY:] I looked at Appendix B, Table 4, which contains the proposed nitrate loading risk factor criteria. It completely guts the University of California hazard index. The soil factor is completely eliminated.
>
> That's just like saying the body doesn't need the heart or the lungs . . .
>
> Two major factors which contribute to the loading is -- one is denitrofication, which completely removes nitrogen from the system . . . .
>
> The other is the water movement through the soil, which carries the nitrogen.
>
> Those are the two main factors on the load. Both of those are intimately tied to the soil profile characteristics, and you cannot come up with a reliable index by neglecting the soil. (Transcripts of Proceedings, March 17, 2011, California Regional Water Quality Control Board, Central Coast Region, Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands, Order

No. R3-2011-0006, Watsonville, California ("March 2011 Transcript"), pp. 168:21-169:15.)

Further, in supporting evidence for the Hazard Index Concept, the UCANR identifies soil and sediment texture as a key factor in the hazard index. The UCANR specifically found that NO3 (nitrate) concentrations were not significantly correlated to the estimated amount of nitrogen fertilizer, and concentrations, therefore, "were most likely affected by factors such as soil and sediment texture." (UCANR, Supporting Evidence for the Nitrate Groundwater Pollution Hazard Index Concept, p. 2, attached hereto as Exhibit A.) In the same document, the UCANR also notes as follows:

> Letey et al. (977) reported the results of an extensive investigation of agricultural tile drain effluents in California. The annual total mass of the NO3 collected in tile drainage water was inversely correlated to the highest percent of clay in the soil above the tile depth. This is consistent with the hypothesis that clay layers in the soil reduce the hazard index by restricting the rate of water flow and/or causing denitrification. Other studies in California have shown that textural changes in profiles can have significant effects on NO3 loss below the root zone (Lund et al. 1974, Pratt et al. 1972). (*Ibid.*)

Considering the UCANR's evidence with respect to soil characteristics and effects on NO3 concentrations, a nitrate loading risk factor determination that ignores soil types and characteristics is seriously flawed. Also, the UCANR does not include irrigation water concentration in its hazard index concept. Instead, it consists of an overlay and index using soils, crops, and irrigation systems. Accordingly, the Central Coast Water Board's inclusion of irrigation water nitrate concentration is inconsistent with the UCANR's hazard index concept and is not supported by evidence in the record of its appropriateness, usefulness, or any benefit it will provide. Thus, by arbitrarily including criteria and excluding necessary factors, the resulting Table 4 methodology is questionable in its value and will not provide the Central Coast Water Board with useful information inherent to the regulation of water quality or with specific nitrate loading risk to individual farms/ranches. Consequently, nitrate loading risk calculated pursuant to Table 4 will provide little to no benefit to the environment.

With respect to UCANR's nitrate hazard index, although it is a better methodology for determining risk, this methodology also has fundamental flaws, and does not provide any direct

environmental benefit. First, the inherent purpose behind UCANR's index is: "To provide information for farmers to voluntarily target resources for management practices that will yield the greatest level of reduced nitrogen contamination potential for groundwater by identifying the fields of highest intrinsic vulnerability." (UCANR, The Hazard Index Concept, p. 2, attached hereto as Exhibit B.) In other words, it is simply a guideline tool – not a regulatory tool. It was not developed, nor was it intended to be used, for regulatory purposes. Moreover, like the Central Coast Water Board's Table 4, it is too simplistic to accurately determine nitrate loading risk to individual farms/ranches. (Zelinski Decl., ¶¶ 17-20.) The most important factor in determining risk is site-specific management practices, which are not comprehensively captured in either methodology. (March 2011 Transcript, p. 171:12-17 ["DR. LETEY: . . . -- the thing that's going to dictate what goes down is the farmer management. And we can, and should, monitor and focus attention on monitoring the farmer management. And -- and induce those management practices that lead to reduced loading."].) Therefore, the use of UCANR's nitrate hazard index, similar to the use of Table 4, is improper and will provide the Central Coast Water Board with no useful information or environmental benefit.

In addition to determining nitrate risk loading factors, the Conditional Waiver requires Tier 2 and Tier 3 growers that have farms/ranches with High Nitrate Loading Risk to determine and report total nitrogen applied "per crop, per acre, per year to each farm/ranch" as part of the Annual Compliance Form. (Tier 2 MRP, pp. 13-14; Tier 3 MRP, p. 13.) Further, "total nitrogen must be reported in units of nitrogen, for any product, form, or concentration including, but not limited to, organic and inorganic fertilizers, slow release products, compost, compost teas, manure, extracts, nitrogen present in the soil, and nitrate in irrigation water." (*Ibid.*) To track and account for this information, growers will need sophisticated databases because there may be thousands of different combinations. For example, as stated by Dr. Zelinski, a large vegetable farm will have thousands upon thousands of total nitrogen application events that must be determined and reported:

> As an example, one farmer with whom I consult farms about 8,000 acres of vegetables in the Salinas Valley. Each acre is planted an average of 2.5 times each year, leading to about 20,000 crop-acres per year. On each of those acres, 3 to 4 fertilizer applications are made in addition to cover crop additions and potential compost additions. If there are 5 potential additions of materials, which may contain nitrogen (not including irrigation water), there would be 100,000 events that need to be calculated to comply with the Conditional Waiver. Additionally, if we expand this example to include irrigation events, typically 5 per crop, we now have 500,000 events to report on – for just this one farm. (Zelinski Decl., ¶ 23.)

This requirement, in addition to other elements required under irrigation and nutrient management plans ("INMP"), will generate paperwork, will be time consuming, and will not provide any useful information or directly benefit the environment. Dr. Los Huertos testified to this exact point, stating:

> . . . I know, in terms of a regulatory context, you're going to generate a lot of paperwork to prioritize a lot of farms, people are going to make a lot of visits and they're going to say, what happened? These reports didn't tell us anything. And I'm absolutely sure of that. (Transcript of March 14, 2012 Hearing of the Waiver of Waste Discharge Requirements Discharged From Irrigated Lands, Central Coast Regional Water Quality Control Board Panel Hearing, San Luis Obispo, California ("March 14, 2012 Transcript"), p. 215:10-15.)

Due to the speculative nature with respect to the information requested for nitrate hazard determinations and total nitrogen applied, it is even more inappropriate to then require that the information be publicly reported. It has no value in determining potential impacts to water quality and could be misused, or misinterpreted. Accordingly, the specific requirements for annual compliance form reporting, including the reporting requirements for nitrate hazard index and total nitrogen applied, must be stayed by the State Water Board while it conducts its review of the underlying petitions.

C. Individual Surface Water Discharge Monitoring and Reporting

Under the Conditional Waiver and Tier 3 MRP, Tier 3 farms/ranches are subject to individual surface water discharge monitoring requirements. (Conditional Waiver, p. 29; Tier 3 MRP, pp. 14-17.) The Conditional Waiver and Tier 3 MRP collectively fail to identify why such information is necessary from Tier 3 farms/ranches to protect the environment, and fail to explain the benefit to be gained from the information.

The Conditional Waiver assumes that farms/ranches meeting Tier 3 criteria are a threat to surface water quality to such an extent that individual discharge monitoring is required. However, there is no specific evidence that links the proposed criteria to actual water quality threats, and therefore there is no evidence to support the requirement for individual discharge monitoring. Dr. Los Huertos, when evaluating the individual surface water discharge monitoring and reporting requirements, opined:

> 19. The stated purpose of the individual surface water discharge monitoring is to "a) evaluate the quality of individual waste discharges, including concentration and load of waste (in kilograms per day) for appropriate parameters, b) evaluate effects of waste discharge on water quality and beneficial uses, and c) evaluate progress towards compliance with water quality improvement milestones in the Order. (Tier 3 MRP, p. 15.)
>
> 20. Based on my professional experience, individual surface water discharge monitoring will not meet the stated purpose of the Tier 3 MRP. (Los Huertos Decl., ¶¶ 19, 20.)

Moreover, the burden of complying with this requirement in the interim is not reasonable in comparison to the Central Coast Water Board's need for the information. The Conditional Waiver does not include any specifically articulated findings that explain why such individual surface water monitoring is necessary. As such, the burden, including the associated costs, of conducting individual surface water discharge monitoring and reporting far exceeds any supposed benefit to be obtained by the Central Coast Water Board.

Overall, the Conditional Waiver and MRP Orders are unlikely to result in improvements in water quality because they shift limited grower resources away from investing in new technology and implementing new management practices that will benefit water quality, and instead require growers to focus on expensive monitoring and reporting requirements that are burdensome, unwarranted, and will provide no substantiated benefits to the environment.

III. Central Coast Water Board Actions Required for Compliance

Although the State Water Board's Notice of Public Hearing specifically directs questions with respect to actions necessary for compliance to the Central Coast Water Board, we believe it appropriate for us to provide our interpretations with respect to the requirements as they are stated

in the Conditional Waiver. It is important to note that Central Coast Water Board statements with respect to use of discretionary enforcement are speculative and do not actually determine what actions constitute compliance with the terms of the Conditional Waiver.

A. Water Quality Standards Compliance

The Conditional Waiver and MRP Orders collectively put growers and landowners in immediate jeopardy for not complying with water quality standards. Grower-Shipper and Farm Bureau members, and the agricultural community in general, understand that there is a need to implement management practices that are protective of both surface and ground waters. Many in agriculture already are implementing such practices. However, there is general acknowledgment that water quality improvements will take time, and in some instances protective management practices must be developed. Unfortunately, the Conditional Waiver and MRP Orders fail to provide growers with any clear legal protection for any time period.

The clear language of the many provisions throughout the Conditional Waiver illustrates the requirement for immediate compliance with water quality standards and the Central Coast Region Water Quality Control Plan ("Basin Plan"). For example, the following provisions all call for immediate compliance and do not contain qualifying language or provide future time frames for compliance:

- Provision 22: Dischargers must comply with applicable water quality standards, as defined in Attachment A, protect the beneficial uses of waters of the State and prevent nuisance as defined in Water Code section 13050. (Conditional Waiver, p. 18, ¶ 22.)
- Provision 23: Dischargers must comply with applicable provisions of the Central Coast Region Water Quality Control Plan (Basin Plan) and all applicable water quality control plans as identified in Attachment A. (Conditional Waiver, p. 18, ¶ 23.)

These provisions collectively require immediate compliance with all water quality standards, without due regard for time schedules or other considerations. They also assume that management practices exist and if utilized will ensure compliance with water quality standards. However, as repeatedly indicated by agricultural specialists and researchers, that is not

necessarily the case. For example, in testimony provided by Dr. Timothy K. Hartz, Extension Specialist and Agronomist with the University of California, to the Central Coast Water Board at its July 8, 2010, workshop, he stated that, "[t]here are practical limitations on agriculture that will make control of nitrate losses especially concentration based control down to 10 ppm, very difficult or impossible to reach." (Central Coast Water Board Workshop to Discuss Preliminary Draft Staff Report Recommendations for an Updated Agricultural Order, Public Comments and Alternative (July 8, 2010) (July 2010 Workshop), Audio 4, 40:30.) Dr. Hartz also testified that, "[c]ertain conservation measures discussed to remove discharge from fields such as vegetative ditches and filter strips may have good effectiveness for certain pollutants, but for nitrates they have very limited effectiveness." (July 2010 Workshop, Audio 4, 38:30.)

Similarly, Mr. Michael Kahn, an Irrigation Water Resource Advisor for the University of California Cooperative Extension, testified that, "UC researchers and advisors like myself participate in evaluation and development of practices that can improve farm water quality. However, although we are developing effective practices, these practices can't be used in every situation." (A true and correct copy of the Transcript of pertinent part of July 2012 Workshop was previously attached as Exhibit H to Grower-Shipper Petition, p. 9:8-15.)

Representatives for agriculture repeatedly raised this as an issue to the Central Coast Water Board. Further, Central Coast Water Board members agreed that they did not expect immediate compliance to occur.

> MR. YOUNG: Before I call for a vote on Dr. Hunter's motion, I just want to say to the Ag community and the public that I certainly don't expect to see possibly even immediate, you know, water quality changes . . . . I know that this is going to take in some regions -- some part of our regions years and years and years to get to where we want to be. (Transcript of March 15, 2012 Continuation of the Hearing of the Waiver of Waste Discharge Requirements Discharged From Irrigated Lands, Central Coast Regional Water Quality Control Board Panel Hearing, San Luis Obispo, California ("March 15, 2012 Transcript"), p. 137:7-19.)

However, Counsel McChesney advised the Central Coast Water Board that changes were not necessary because ". . . compliance with Water Quality Standards means to implement management practices. If they aren't effective in reducing discharges to meet Water Quality

Standards, that they revise or do new management practices." (March 15, 2012 Transcript, p. 54:1-5.) Counsel McChesney also stated that the same language is in the Central Valley Order. (March 15, 2012 Transcript, p. 54:6-8.) Counsel McChesney further stated: ". . . there are numerous provisions in the Order, both in the findings and in the Order part that make it clear that for purpose . . . ." (March 15, 2012 Transcript, p. 53:22-24) and, "There's nothing in the Order that would require them to be in compliance tomorrow. It's made very clear." (*Id.*, p. 55:5-7.)

Unfortunately, Counsel McChesney was mistaken. The plain language of the Conditional Waiver does not contain any provisions qualifying the immediate compliance language or provide for any appropriate compliance schedules. Further, the Central Valley Regional Water Quality Control Board's ("Central Valley Water Board") Order No. R5-2006-0053, Coalition Group Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands (June 22, 2006), includes a provision that requires, "[d]ischargers who are participants in a Coalition Group shall implement management practices, as necessary, to improve and protect water quality and to achieve compliance with applicable water quality standards." (Order No. R5-2006-0053, pp. 16-17.) The Central Valley Water Board's provision is equivalent to Conditional Waiver Provision 12, which is not being challenged in this petition or raised by the State Water Board. The language in question here, Provisions 22 and 23, are stand-alone provisions. They are not modified by or subject to any additional language that suggests compliance with these provisions is limited by the ability to implement management practices.

While the Conditional Waiver includes a finding that recognizes immediate compliance may be infeasible, and appears to reference provisions of the Conditional Waiver that provide dischargers with additional time to comply, such findings are not enforceable provisions of the Conditional Waiver, and no timetable for achieving compliance appears to specifically apply to Conditions and Provisions 22 and 23. (See Conditional Waiver, Provision 82 (excluding Table 4 milestones and time schedule for compliance from applicability to Conditions and Provisions); Conditional Waiver, Attachment A, Additional Findings, Applicable Water Quality Control Plans and Definitions, ¶ A.2, p. 41; see also Staff Report for Regular Meeting of September 1, 2011,

prepared on July 6, 2011, p. 18, stating, "[t]he milestones, as described in Table 4 of the Draft Agricultural Order are not in of themselves compliance conditions and are not enforceable. They are targets or goals that staff will use to evaluate effectiveness of implementation efforts and progress improving towards water quality.")

In sum, the Conditional Waiver provisions establish stand-alone, independent applicable requirements that discharges must comply with applicable water quality standards and any other relevant provision of the Basin Plan, those provisions apply to all dischargers who operate under the terms of the Conditional Waiver, and the Conditional Waiver requires monitoring and reporting requirements to determine compliance. (See Conditional Waiver, pp. 13, 18; see also Tier 1 MRP, p. 1; Tier 2 MRP, p. 1; and Tier 3 MRP, p. 2.)

Accordingly, monitoring data and information reported to the Central Coast Water Board by regulated entities in accordance with the terms of the Conditional Waiver and MRP Orders could create immediate liability and may be used in immediate enforcement actions against dischargers subject to the terms of the Conditional Waiver, even if the discharger is in compliance with all other provisions of the Conditional Waiver.

Considering the uncertainty associated with meeting water quality standards immediately, and the immediate liability that may be imposed, the State Water Board must stay these provisions while it considers the merits of the underlying petitions.

B. Maintenance of Containment Structures

Many growers within the Central Coast Region use containment structures or retention ponds to control, capture, retain, and reuse stormwater runoff and irrigation water. The use of ponds and structures provides many benefits not only to the grower but also to the environment. Irrigation and stormwater runoff stored in a retention pond and then used as a source of irrigation water can reduce surface water use in an area, recharge groundwater aquifers, and reduce loadings to nearby waters of the state. Unfortunately, many of these benefits are lost due to the prescriptive nature of the Conditional Waiver.

As prescribed in the Conditional Waiver, "dischargers who utilize containment structures (such as retention ponds or reservoirs) to achieve treatment or control of the discharge of wastes must manage, construct, or maintain such containment structures to avoid percolation of waste to groundwater that causes or contributes to exceedances of water quality standards, and to minimize surface water overflows that have the potential to impair water quality." (Conditional Waiver, p. 30, ¶ 33.) Provision 33 requires growers with existing or new containment structures to construct or retrofit existing structures in such a manner as to prevent any percolation to groundwater. By using the word "contribute," this regulation essentially requires growers to totally eliminate any potential leaching to groundwater, as any level of nitrate above 0 ppm could "contribute" to the problem (including the fact that irrigation water in many areas of the Central Coast Region is already above 0 ppm). In addition to the large costs associated with lining structures to prevent any "contribution," this provision negatively impacts the groundwater by prohibiting percolation of water to groundwater, thus preventing needed and beneficial groundwater recharge.

With respect to what actions are required to comply with this provision, many growers believe that to comply with the requirement they will need to line existing containment structures, and include liners for all future containment structures. Although the Central Coast Water Board may suggest otherwise, lining ponds is the only certain method of ensuring that containment structures avoid percolation of waste to groundwater. For many growers, as discussed above, lining costs will be significant considering the square footage of containment structures for their total operations.

IV. Conclusion

The information submitted here in response to the State Water Board's Notice of Public Hearing further supports the Stay Request submitted by Grower-Shipper on April 16, 2012. (See Grower-Shipper Association of Central California, Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties, and Western Growers Request for Stay and Memorandum of Points and Authorities in Support Thereof ("Grower-Shipper Request for Stay").) Collectively,

the information here and the Grower-Shipper Request for Stay demonstrate that a stay of the challenged provisions of the Conditional Waiver and MRP Orders is necessary to prevent Grower-Shipper and Farm Bureau members from incurring substantial harm in the form of an expenditure of private resources and immediate exposure to liability. Conversely, staying the provisions in question for the time necessary for the State Water Board to conduct its review of the underlying petitions will not harm the environment. Accordingly, Grower-Shipper and Farm Bureau respectfully request that the State Water Board stay the provisions identified in the Grower-Shipper Request for Stay.

SOMACH SIMMONS & DUNN
A Professional Corporation

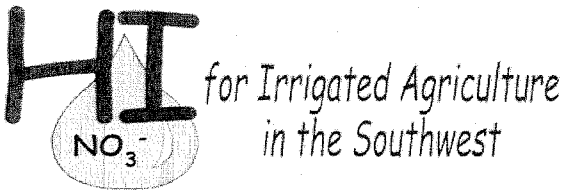
DATED: August 27, 2012

By: _____
Theresa A. Dunham, Attorneys for Petitioners Grower-Shipper Association of Central California, Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties, and Western Growers

CALIFORNIA FARM BUREAU FEDERATION

DATED: August 27, 2012

By: _____
Kari E. Fisher, Attorneys for Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau



SUPPORTING EVIDENCE FOR THE NITRATE GROUNDWATER POLLUTION HAZARD INDEX CONCEPT

A supporting document for the
UC Center for Water Resources (http://www.waterresources.ucr.edu)
Nitrate Groundwater Pollution Hazard Index

The USGS measured the occurrence of nitrate in ground water beneath three agricultural land-use settings in the Eastern San Joaquin Valley of California during the period 1993-1995 (Burow et al. 1998). Water samples were collected from 60 domestic wells in land-use settings of (1) vineyards, (2) almond trees, and (3) a crop grouping of corn, alfalfa, and vegetables.

The vineyards and almonds were located on similar coarse-grained, upper and middle parts of the alluvial fans with rather rapid water transmission properties and low potential for denitrification. The three-crop setting was on the lower part of the fan consisting of relatively fine-grained sediments that would have lower water transmission properties and a denitrification potential. We would rate the soil hazard index higher on the vineyard and almond lands than the three-crop lands. We give the vineyards a lower hazard index than the almonds because of the much lower N application to vineyards. The three-crop system includes alfalfa with the lowest hazard index and vegetables with the highest hazard index so the cumulative effect is unknown and is expected to be intermediate.

The NO_3 concentrations in the wells were highest in the almond area, intermediate in the three-crop area, and lowest in the vineyard area. We have emphasized that NO_3 concentration is not necessarily a reliable indicator of management, but in this case it is an appropriate criterion for some comparisons. The concentrations of chloride and NO_3 were correlated in the almond and vineyard settings indicating very little denitrification and that is consistent with the soil properties. We assume that the irrigation of the two crops provided similar leaching factions. Therefore, the higher concentration would be associated with the higher N application to almonds than for the vineyards. Furthermore, with similar amounts of deep percolation, the higher concentration would also mean higher N mass flow.

The soils for the three-crop system were expected to have lower hydraulic conductivity and also possible denitrification. The electrical conductivity (EC) and chloride concentration of the water

EXHIBIT A

were higher in the three-crop area than for the other two orchard crops, suggesting a lower leaching faction consistent with the soil properties. Also, the NO_3 and chloride concentrations were not correlated in the three-crop system, which indicates denitrification. The dissolved oxygen was also lower in the three-crop system than the others. Because of the diversity of crops in the three-crop system, it is not possible to draw other conclusions.

The USGS measured the NO_3 concentrations in ground water samples collected from 3 domestic wells in 1995 (Burow et al. 1998). The results were related to various physical and chemical factors in an attempt to understand the processes that control the occurrence and concentrations of nitrates. The results were also compared with results of the analyses of samples collected in 1986-87.

One major finding, which is consistent with numerous other studies, is that the NO_3 concentrations were not significantly correlated with the estimated amount of nitrogen fertilizer applied within a 0.25- and a 0.5-mile radial distance from the sampled well. The concentrations, therefore, were most likely affected by factors such as soil and sediment texture.

Nitrate concentration generally decreased with increasing depth below the water table. The deeper waters are older waters, which reflect lower historical application rates of nitrogen fertilizers.

The investigators did not find a relationship between NO_3 concentrations and soil permeability, hardpan percent, and clay percent. The lack of correlation may be explained by counterbalancing effects of these soil properties on NO_3 concentrations. Low soil permeability, hardpans, and clay would restrict the rate of water flow contributing to a low leaching faction, which could lead to higher NO_3 concentrations. Additionally, these soil properties are conducive to higher denitrification, which would reduce the NO_3 concentrations. Since there was no significant correlation between the soil properties and NO_3 concentration, neither mechanism predominated. Both mechanisms, however, contribute to lower NO_3 mass movement, but this was not measured.

Nitrate concentrations were positively correlated to dissolved oxygen concentrations. This result provides evidence that denitrification was a factor affecting the NO_3 concentrations. Nitrate concentrations were also positively correlated to specific conductance, which is related to salt concentration. This result provides evidence that increased concentration associated with lower leaching factions was a factor affecting NO_3 concentrations. This conclusion is further supported by the finding that the nitrate and specific conductance was more strongly correlated when the chemically reduced environmental samples were removed from the data set used in the statistical analyses.

Letey et al. (1977) reported the results of an extensive investigation of agricultural tile drain effluents in California. The annual total mass of the NO_3 collected in tile drainage water was inversely correlated to the highest percent of clay in the soil above the tile depth. This is consistent with the hypothesis that clay layers in the soil reduce the hazard index by restricting the rate of water flow and/or causing denitrification. Other studies in California have shown that textural changes in profiles can have significant effects on NO_3 loss below the root zone (Lund et al. 1974, Pratt et al. 1972).

References:

Burow, K. R., S. V. Stork, and N. M. Dubrovsky. 1998. Nitrate and pesticides in ground water in the eastern San Joaquin Valley, California: Occurrence and trends. USGS Water Resources Investigations Report 98-4040, Sacramento, CA. 33 pages.

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Lund, L. J., D. C. Adriano, and P. F. Pratt. 1974. Nitrate concentrations in deep soil cores as related to soil profile characteristics. J. Environ. Qual., 3: 78-82.

Pratt, P.F., W. W. Jones, and V. E. Hunsaker. 1972. Nitrate in deep soil profiles in relation to fertilizer rates and leaching volume. J. Environ. Qual., 1: 97-102.

HI for Irrigated Agriculture in the Southwest

THE HAZARD INDEX CONCEPT

A supporting document for the UC Center for Water Resources (http://www.waterresources.ucr.edu) Nitrate Groundwater Pollution Hazard Index

The United States Congress appropriated funds to the US Geological Survey (USGS) to begin the National-Water Quality Assessment (NWQA) Program in 1991. As part of the NWQA Program the USGS works with other federal, state and local agencies to understand the spatial extent of water quality, how water quality changes with time and how human activities and natural factors affect water quality across the nation. The USGS published a report (USGS 1999) entitled, "The Quality of Our Nation's Waters" with specific reference to nutrients and pesticides. For the purposes of our report, we will only address nitrogen issues.

Some of the highest levels of nitrogen were reported to occur in streams and groundwater in agricultural areas. However, concentrations were found to vary considerably from season to season as well as among watersheds. A graphical plot of nitrogen inputs to agricultural land versus median nitrate concentrations in underlying shallow groundwater produced a complete scatter of points (USGS 1999, p 47). The range of nitrate concentrations was the same for all levels of nitrogen input. Differences in natural features and land management practices make some areas more vulnerable to contamination than other areas. Recognition of differences in vulnerability to contamination can help target the appropriate level of protection and monitoring to major aquifers at greatest risk. The most extensive control strategies should be considered in the more vulnerable settings.

Nolan (2001) used multi variant logistic regression models based on more than 900 sampled wells to predict the probability of exceeding 4 mg/L of nitrate in ground water in the United States. The model consisted of 6 variables: nitrogen fertilizer loading, percent crop land-pasture, natural log of population density, percent well-drained soils, depth to seasonally high water table, and presence or absence of a fracture zone within an aquifer. Although valuable at the large landscape scale, the results are not useful on a farm level scale where management decisions are made which could affect ground water degradation from nitrogen. Nevertheless, the concept of establishing vulnerability to groundwater contamination is valid and even more appropriate on a farm scale.

Estimates of groundwater vulnerability can be separated into intrinsic vulnerability and specific vulnerability (National Research Council, 1993). Intrinsic vulnerability is related to factors of which the farmer has no control such as the hydrologic properties of the soil and hydrogeologic factors

such as proximity of an aquifer to land surface, etc. Although the farmer can choose the crop to grow, the choice is usually made on economic factors. Once a crop is chosen, each crop has an intrinsic vulnerability for groundwater contamination from nitrates. Likewise, irrigation systems may be selected, but each irrigation system has an intrinsic vulnerability. Specific vulnerability is a function of management factors such as quantity, rate, timing, and methods of nitrogen and water application and other agricultural management practices. Therefore, the farmer has some level of control over the specific vulnerability with little or no control over the intrinsic vulnerability.

The National Academy of Science Water Science and Technology Board appointed a committee on Techniques for Assessing Groundwater Vulnerability. The committee defined groundwater vulnerability as: "The tendency or likelihood for contaminants to reach a specified position in the groundwater system after introduction at some location above the uppermost aquifer." They pointed out that this definition of groundwater vulnerability is flawed, as is any other, by a fundamental principle that they stated as the First Law of Groundwater Vulnerability: "All groundwater is vulnerable." They also proposed a Second Law of Groundwater Vulnerability: "Uncertainty is inherent in all vulnerability assessments."

The committee suggested a vulnerability assessment process. The first step is to identify the purpose of the assessment. The next step is to select a suitable approach for conducting the assessment. They listed three methods of assessment: 1) overlay and index methods, 2) methods using process-based simulation models, and, 3) statistical methods. The report elaborated on each of these methods. We will follow the proposed steps by stating the purpose and then describing the assessment method.

PURPOSE: To provide information for farmers to voluntarily target resources for management practices that will yield the greatest level of reduced nitrogen contamination potential for groundwater by identifying the fields of highest intrinsic vulnerability.

ASSESSMENT METHOD: We used the overlay and index method. Although process-based simulation models were not specifically used, the basic physical and chemical factors that are incorporated into these models were used in deriving an index number. The overlay consists of soil maps, crop and irrigation system distributions. The soils, crops and irrigation systems were each indexed by an approach described below.

This approach is consistent with the recommendations of a Nutrient Technical Advisory Committee (TAC) appointed by the California State Water Resources Control Board. The TAC was assigned to propose a nutrient management approach in California that would meet the varied interests of those who have a stake in the quality of California's waters. The TAC proposed that farmers complete a hazard index for each field on their farm based on the soil, crop and irrigation systems. The TAC proposed that the soil be assigned a hazard value of 1, 2 or 3. Soils classified as 1 are those that have textural or profile characteristics that inhibit the flow of water and create an environment conducive to denitrification. Both denitrification and restrictive water flow decrease the migration of nitrate to groundwater. Conversely those soils classified as 3 are most sensitive to groundwater degradation by nitrate because of the high water infiltration rates, high transmission rates through their profile, and

low denitrification potential. In our case, we expanded the hazard values to 1 through 5, but used the same criteria as proposed by TAC for assigning higher or lower hazard values.

The TAC proposed that crops be classified into three hazard indices based on their degree of potential for nitrate leaching. They suggested that those with the highest potential for nitrate leaching, which would have a hazard index of 3, are those with the following characteristics: (1) The nitrogen uptake in the crop is a small fraction of the total nitrogen applied to the crop; (2) the crop requires high nitrogen input and frequent irrigation to ensure rapid vegetative growth; (3) the value of the crop is such that there is a tendency to add excess nitrogen to ensure no nitrogen deficiencies; (4) the crop is not adversely affected when more than adequate amounts of nitrogen are applied; and (5) the crop has a shallow root system where a small amount of water movement could carry nitrate below the root system. Crops with the opposite characteristics of those listed would have a low potential for nitrate leaching and have a hazard index of 1. Crops with intermediate characteristics would be classified with a hazard index of 2.

The criteria that we used in assigning a hazard index for crops were consistent with those suggested by TAC, but differed in detail. We also expanded the crop hazard index to 1 through 4. The factors considered in establishing a hazard index for field crops and vegetables were as follows: 1) rooting depth, 2) ratio of N in the crop tops to the recommended N application, 3) fraction of the crop top N that is removed from the field in the marketed product, 4) the magnitude of the peak N uptake rate, and 5) whether the crop is harvested at a time when N uptake rate is high. A slightly modified set of criteria was used for tree and vine crops. The rooting depth is quite great in all cases and none is harvested at the time of peak N uptake rate. Therefore, these criteria were eliminated and replaced by the magnitude of leaf N deposit for trees and vines.

The crops with a shallower rooting depth have a higher potential for N leaching than deep-rooted crops. Crops that take up a high percentage of the recommended N application provide for a lower hazard for N leaching than those which take up a low percentage, thus leaving much N in the soil. Furthermore, removal of much of the N in the crop tops with the harvested product creates a lower hazard than when the crop residues containing much N are left on the field. Crops that have a very high peak N uptake rate over a short period are considered to be more hazardous than those with low peak N uptake rate because they require large quantities of mineral N to be available for that time period.

A matrix was constructed for each crop and the criteria used to establish the hazard index. The hazard index number that was chosen for each crop was based on an overall consideration of all the criteria. For example, lettuce has a hazard index of 4 because it is shallow rooted, is harvested at the time of peak uptake rate, and much of the N in the tops remains in the field. Conversely, alfalfa has a hazard index of 1 because it is deep rooted and nitrogen fertilizer application is not required. The matrix, as well as the hazard index number, will be reported for each crop.

The TAC recommended that the irrigation system be classified into a hazard index of 0 through 3. The "0" hazard index is a micro-irrigation system accompanied by fertigation. Small amounts of

water and nutrients can be frequently applied in quantities to match the crop need. A micro irrigation system without fertigation is assigned a hazard index of 1. Sprinklers used throughout the irrigation season or for pre-irrigation for crop establishment is assigned a hazard index of 2. Entire surface irrigation systems such as furrow are assigned a hazard index of 3. We used the same criteria for indexing irrigation systems except that our range was 1 through 4 rather than 0 through 3.

In our case, the overlay and index method consists of having an overlay of the soil, crop and irrigation system maps and multiplying the hazard index numbers for each. The intrinsic hazard index number can range from 1 through 80. The TAC suggested adding the index numbers. Adding the numbers would provide a much smaller range between 3 and 13, which would consequently make it more difficult to distinguish the relative hazards among combinations of soils, crops, and irrigation systems.

Although the TAC proposed that farmers complete a hazard index for each field, the proposal has never been implemented. A major impediment to the implementation is that soils and crops have not been assigned hazard rating values. We have developed tables of hazard rating numbers for the major irrigated soils and crops in Arizona, California, and Nevada that can be used by farmers to assess the relative hazard for groundwater degradation by nitrate for each of their fields.

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National Research Council. 1993. Ground water vulnerability assessment – Predicting relative contamination potential under conditions of uncertainty. National Academy Press, Washington, DC.

Nolan, B. T. 2001. Relating nitrogen sources and aquifer susceptibility to nitrate in shallow ground waters of the United States. Ground Water, 39(2):290-299.

USGS. 1999. The Quality of our Nation's Waters. U.S. Geological Survey Circular 1225.

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BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File Nos. A-2209(b), (d) DECLARATION OF BOB CAMPBELL IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

I, Bob Campbell, declare as follows:

1. I am the owner/operator of Bob Campbell Ranches, Inc.

2. On March 15, 2012, the Central Coast Regional Water Quality Control Board (Central Coast Water Board) adopted Order No. R3-2012-0011 *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Conditional Waiver), Order No. R3-2012-0011-01 *Monitoring and Reporting Program for Tier 1 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 1 MRP), Order No. R3-2012-0011-02 *Monitoring and Reporting Program for Tier 2 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 2 MRP), and Order No. R3-2012-0011-03 *Monitoring and Reporting Program for Tier 3 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 3 MRP). (True and correct copies of these Orders were previously attached as Exhibits A, B, C, and D, respectively, to Grower-Shipper Association of Central California, Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties, and Western Growers' Petition for Review and Statement of Points and Authorities in Support Thereof (April 16, 2012).) I am familiar with the requirements contained in the Conditional Waiver, Tier 1 MRP, Tier 2 MRP, and Tier 3 MRP.

3. On April 13, 2012, I declared that for Bob Campbell Ranches, Inc., estimated costs to comply with the Tier 2 and Tier 3 requirements collectively through the end of December 2013, and based on information then available, to be between $155,740 and $191,680. Since April 13, 2012, I have obtained more information with respect to application of the requirements of the Conditional Waiver. We have had some changes to the number of farms/ranches that we are responsible for; of the 38 that I originally submitted, some of the landlords have elected to assume compliance responsibilities and others we no longer lease. We now have responsibility for 27 farms/ranches. Our most recent cost estimates, based on the new information, have increased to $328,480 for the 27 farms/ranches. These are estimated costs that would occur between now and the end of 2013.

4. On August 2, 2012, the State Water Resources Control Board (State Water Board) issued a Notice of Public Hearing on Stay Requests. In the Notice of Public Hearing on Stay Requests, the State Water Board requested that parties provide cost estimates, and the underlying assumptions for those cost estimates, for specific Conditional Waiver and MRP requirements identified by the State Water Board. The requirements identified by the State Water Board include the following: installation of back flow prevention devices; maintenance of containment structures; maintenance of riparian vegetative cover and of riparian areas; practice effectiveness and compliance reporting; groundwater monitoring; annual compliance form reporting; determination of nitrate loading risk factors, determination of total nitrogen applied; photo monitoring; and, individual surface water discharge monitoring and reporting.

5. In paragraphs 7 through 15 below, I have estimated to the best of my knowledge costs for the individual items that are relevant and applicable to Bob Campbell Ranches, Inc.

6. On May 17, 2012, Bob Campbell Ranches, Inc. received communication from the Central Coast Water Board that identified tier designations for Bob Campbell Ranches, Inc.'s farms/ranches. According to the Central Coast Water Board communication, Bob Campbell Ranches, Inc. has 26 farms/ranches composed of 9 Tier 1 farms/ranches; 17 Tier 2 farms/ranches; and, 0 (zero) Tier 3 farms/ranches. One ranch has been added since May 17, 2012, that has not received a tier designation for a total of 27 farms/ranches. The cost estimates below are based on these tier designations as applicable.

7. Installation of back flow prevention devices: For Bob Campbell Ranches, Inc., I estimate that there are 38 back flow prevention devices that must be installed solely to comply with the terms of the Conditional Waiver. Depending on the device installed, the cost will range from $400 to $600 per device. Using an average of $500 per device, the total is $19,000. Installation of each device will run from $1,800 to $3,000. Using an average of $2,400 per device for installation, the total is $91,200. This cost is based on supplier cost estimates.

8. Maintenance of containment structures: I am not able to provide cost estimates for this item as we do not currently have containment structures on any of the ranches I am currently farming. If I were to be required to install containment structures, this would add additional cost.

9. Maintenance of riparian vegetative cover and of riparian areas: It is my understanding that the Central Coast Water Board's definition of the "maintenance of riparian vegetative cover and riparian areas" is to leave existing vegetation as is. Based on this understanding, I do not anticipate that there will be any new or added costs with respect to maintaining existing, naturally occurring, riparian vegetative cover, or for maintaining riparian areas.

10. Practice effectiveness and compliance reporting: For Bob Campbell Ranches, Inc., I am unable to provide estimates as I do not understand what is required with respect to this provision in the Conditional Waiver. There may be additional costs involved in complying with this section.

11. Groundwater monitoring: Bob Campbell Ranches, Inc. has elected to participate in the Cooperative Groundwater Monitoring Program. I anticipate that I will incur costs associated with hiring a laboratory for well water sampling, analysis, and reporting. I will be required to sample 27 primary irrigation wells and 6 domestic drinking water wells. Total cost estimates for laboratory services are $5,280. Also, in-house staff will be required to receive sample results and file them with my Farm Water Quality Plan. Estimated costs for staff are $5,000. If Bob Campbell Ranches, Inc. is required by the Central Coast Water Board to do individual monitoring, I would incur additional costs associated with hiring staff to write, submit, and negotiate a groundwater monitoring plan and QAPP.

12. Annual compliance form reporting: Of Bob Campbell Ranches, Inc.'s 27 farms/ranches, 17 are designated as Tier 2 and the farm/ranch with pending tier designation is anticipated to be in Tier 2, and therefore 18 farms/ranches will be subject to the annual compliance form reporting requirement. The electronic format for Annual Compliance Form reporting has not yet been provided by the Central Coast Water Board. Costs for this provision are difficult to estimate because the Conditional Waiver and Tier 2 MRP are vague as to what I will be reporting. It is unclear whether Annual Compliance Forms are reported for the past calendar year, past crop year, or for the crop year of the year in which the Annual Compliance Form is being submitted. Furthermore, it is unclear whether the report is predictive of crops to be

planted in the coming crop year or reports on what was planted in the past year. However, based on the list of information that will be required in the Tier 2 MRP, I estimate that it will cost Bob Campbell Ranches, Inc. $108,000 for the 18 farms/ranches subject to this requirement. This cost estimate is based on the need to hire additional personnel and outside consultants to prepare and track this information. In addition, there would be software costs in order to create a database to keep track of the items listed in the Annual Compliance Form. This cost per farm/ranch equals $57 per acre, for a total of $108,000.

13. Determination of nitrate loading risk factors, determination of total nitrogen applied: For the 300 plus plantings of our 30 plus crops on all farms/ranches, I estimate that it will cost Bob Campbell Ranches, Inc. $40,000 to calculate and record nitrate loading risk factors. This cost estimate is based on production supervisors having to track fertilizer usage and office staff to calculate and enter nitrate loading risk factors. With respect to determining total nitrogen applied on a per acre basis for each farm/ranch, or for each crop, I believe Bob Campbell Ranches, Inc. will have additional costs over and above current farming and accounting practices.

14. Photo monitoring: The Conditional Waiver and Tier 2 MRP collectively require photo monitoring and reporting for Tier 2 and Tier 3 farms/ranches that contain or are adjacent to a water body impaired for temperature, turbidity, or sediment. Of the 18 Bob Campbell Ranches, Inc. farms/ranches in Tier 2, 11 are adjacent to a water body impaired for temperature, turbidity, or sediment. On July 19, 2012, the Executive Officer of the Central Coast Water Board issued a protocol for conducting photo monitoring. It is my understanding, based on the language of the Conditional Waiver, Tier 2 MRP, and Tier 3 MRP, that photo monitoring must be done this year by October 1, 2012, and not again until October 1, 2016. (Tier 3 MRP, pp. 20-21.) After carefully reading the photo monitoring and reporting protocol, it is apparent to me that I will have to hire an outside consulting firm to do this work, at a cost unknown at this time, but estimated upwards of $60,000.

15. Individual surface water discharge monitoring and reporting: Bob Campbell Ranches, Inc. has no farms that have been designated as Tier 3 by the Central Coast Water Board.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 24 day of August 2012, at Lompoc, California.

Bob Campbell

Bob Campbell

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BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File Nos. A-2209(b), (d) DECLARATION OF DIRK GIANNINI IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

I, Dirk Giannini, declare as follows:

1. I am the fourth generation owner and operator of Christensen & Giannini, which is located within the geographic boundaries of the Central Coast Regional Water Quality Control Board (Central Coast Water Board). My wife and daughters, as well as my parents, live in homes on a farm in the northern part of the Salinas Valley. Our family has grown crops in the region for over 80 years. I was born and raised on this ranch that we currently farm, and grow leafy greens, mixed vegetables, and rotate with strawberry growers on the farm we reside on, as well as other farms throughout the valley.

2. On March 15, 2012, the Central Coast Water Board adopted Order No. R3-2012-0011 *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Conditional Waiver), Order No. R3-2012-0011-01 *Monitoring and Reporting Program for Tier 1 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 1 MRP), Order No. R3-2012-0011-02 *Monitoring and Reporting Program for Tier 2 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 2 MRP), and Order No. R3-2012-0011-03 *Monitoring and Reporting Program for Tier 3 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 3 MRP). (True and correct copies of these Orders were previously attached as Exhibits A, B, C, and D, respectively, to Grower-Shipper Association of Central California, Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties, and Western Growers' Petition for Review and Statement of Points and Authorities in Support Thereof (April 16, 2012).) I am familiar with the requirements contained in the Conditional Waiver, Tier 1 MRP, Tier 2 MRP, and Tier 3 MRP.

3. On April 16, 2012, I declared that for Christensen & Giannini, estimated costs to comply with the Tier 2 and Tier 3 requirements collectively through the end of December 2013, and based on information then available, to be between $574,874.12 and $707,419.66. Since April 16, 2012, I have obtained more information with respect to the application of the

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requirements of the Conditional Waiver. Based on the additional information, specific cost estimates, to the extent feasible, for some specific requirements are identified below.

4. On August 2, 2012, the State Water Resources Control Board (State Water Board) issued a Notice of Public Hearing on Stay Requests. In the Notice of Public Hearing on Stay Requests, the State Water Board asks that parties provide cost estimates, and the underlying assumptions for those cost estimates, for specific actions identified by the State Water Board. The actions identified by the State Water Board include the following: installation of back flow prevention devices; maintenance of containment structures; maintenance of riparian vegetative cover and of riparian areas; practice effectiveness and compliance reporting; groundwater monitoring; annual compliance form reporting; determination of nitrate loading risk factors, determination of total nitrogen applied; photo monitoring; and, individual surface water discharge monitoring and reporting.

5. In paragraphs 6 through 12 below, to the best of my present knowledge, I have estimated costs that would be incurred in 2012 and 2013 for the individual provisions below that are relevant and applicable to Christensen & Giannini.

6. On May 17, 2012, Christensen & Giannini received communication from the Central Coast Water Board that identified tier designations for Christensen & Giannini's 19 farms/ranches. According to the Central Coast Water Board communication, Christensen & Giannini has two (2) Tier 1 farms/ranches; fifteen (15) Tier 2 farms/ranches; and, two (2) Tier 3 farms/ranches. The cost estimates below are based on these tier designations that were issued by the Central Coast Water Board.

7. Installation of back flow prevention devices: For Christensen & Giannini, with what I know today, I believe that our operation's wells meet backflow prevention requirements and I will not incur additional costs for installation, retrofit, or maintenance of existing backflow prevention devices through 2013. If, however, there were further clarification regarding fertigation requirements, which would necessitate retrofitting existing well head protections, then, additional costs would be incurred.

8. Maintenance of containment structures: I manage 14 catch basin sumps and 7 reservoirs throughout our operation. In order to comply with this provision, I believe that I will need to line these sump ponds and reservoirs to prevent percolation into groundwater. The estimated square feet of the basin sumps is 939,330 and the estimated square feet of the reservoirs is 1,603,350. At present, I do not have costs for lining these ponds and reservoirs, but anticipate that costs will include plastic lining material or bentenite, engineering time, and possible reinforcement of current dams. To properly construct such basins and since it is not a standard practice, I will have to contract with a professional engineer. I also foresee that I may have to construct new retention ponds as a result of the development of the Individual Surface Water Discharge Monitoring and Reporting.

9. Maintenance of riparian vegetative cover and of riparian areas: For Christensen & Giannini and my existing operation and with what I know today, I do not anticipate that there will be any new or added costs with respect to maintaining existing, naturally occurring, riparian vegetative cover, or for maintaining riparian areas. However, if this provision were interpreted to require installation, operation, and maintenance, these costs would be substantial.

10. Practice effectiveness and compliance reporting: I believe that in order to comply with this provision, I would need in-house technical resources; however, at the present time I am uncertain with respect to the level of expertise that would be needed. Because of this uncertainty, it is not possible to estimate costs for complying with this part of the regulation.

11. Groundwater monitoring: Our family farm has elected to participate in a Cooperative Groundwater Monitoring Program. Today, as this program is being developed, I do not know the cost associated with the implementation of the groundwater monitoring plan and QAPP. I do, however, anticipate incurring costs with staff time to participate, submit paperwork, and any other tasks that are required to make sure we are in compliance with this program. Should I elect to discontinue participation in the Cooperative Groundwater Monitoring Program or if the Cooperative Groundwater Monitoring Program should be rejected, I will incur sampling, analysis, and reporting costs. Also, I will have additional staff costs associated with filing lab

results appropriately with other relevant water quality information. These total estimated costs for individual well water sampling, analysis, and geotracker reporting are approximately $20,000.

12. Annual compliance form reporting, determination of nitrate loading risk factors, determination of total nitrogen applied, photo monitoring, and individual surface water discharge monitoring and reporting: Of Christensen & Giannini's 19 farms/ranches, fifteen (15) are designated as Tier 2 and two (2) are in Tier 3, which are subject to the annual compliance form reporting, nitrate loading risk factor calculations, determination of total nitrogen applied, and photo monitoring requirements. The two (2) Tier 3 ranches are subject to individual surface water discharge and monitoring and reporting requirements. I estimate that I will need to invest in one full-time person to comply with these provisions. This will include salary and benefits, vehicle and maintenance of vehicle, and computer equipment, at a minimum. Additionally, I will have costs associated with data management improvements. Total costs are estimated to be $200,000.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 24th day of August 2012, at Salinas, California.

Dirk Giannini

Dirk Giannini

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BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File Nos. A-2209(b), (d) PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S WITNESS LIST FOR STATE WATER BOARD'S AUGUST 30, 2012 PUBLIC HEARING ON STAY REQUESTS SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

In response to the State Water Resources Control Board's August 2, 2012 Notice of Public Hearing, the Grower-Shipper Association of Central California, Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties, and Western Growers (hereafter, "Grower-Shippers"), and the California Farm Bureau Federation, Monterey County Farm Bureau, San Benito County Farm Bureau, San Luis Obispo County Farm Bureau, San Mateo County Farm Bureau, Santa Barbara County Farm Bureau, Santa Clara County Farm Bureau, and Santa Cruz County Farm Bureau (hereafter, "Farm Bureau") hereby jointly submit this witness list:

1. Bob Campbell:

Mr. Campbell is the owner/operator of Bob Campbell Ranches, Inc. Bob Campbell Ranches, Inc. has over 120 employees, and consists of a total of 38 individual ranches that grow a wide range of crops throughout the year. Bob Campbell Ranches, Inc. currently grows 18 different crops.

2. Stephen L. Clark:

Stephen L. Clark is the Vice President and Special Projects Director of Pacific EcoRisk, Inc., a firm specializing in the performance of aquatic toxicity testing, in addition to other related services. A true and correct copy of Mr. Clark's resume is attached hereto as Exhibit 1.

3. Dirk Giannini:

Mr. Giannini is a fourth generation owner and operator of Christensen & Giannini, which is located within the geographic boundaries of the Central Coast Regional Water Quality Control Board (Central Coast Water Board). Mr. Giannini's wife and daughters, as well as his parents, live in homes on a farm in the northern part of the Salinas Valley. His family has grown crops in the region for over 80 years. He was born and raised on the ranch that they currently farm, and grow leafy greens, mixed vegetables, and rotate with strawberry growers on the farm they reside on, as well as other farms throughout the valley.

4. Lawrence Grice:

Lawrence Grice is the Vice President/Project Manager of Grice Engineering in Salinas, California, where he has worked since 1980. Mr. Grice is a Registered Civil Engineer. He and

his firm have extensive experience in designing and managing the construction of containment structures for agricultural operations.

5. Michael L. Johnson, Ph.D.:

Michael L. Johnson is the President and Managing Partner of MLJ-LLC, a water quality consulting firm that offers expertise in ecology and toxicology, knowledge of quality assurance, understanding and management of laboratory performance, research based on peer reviewed science, and expertise in sampling various media in a range of environments. Dr. Johnson has spent the last 20 years performing monitoring and research on water quality issues in California. A true and correct copy of Dr. Johnson's resume is attached hereto as Exhibit 2.

6. Marc Los Huertos, Ph.D.:

Marc Los Huertos an associate professor of Environmental Science and Policy at California State University, Monterey Bay. Dr. Los Huertos' work has concentrated on testing various management practices to improve water quality in the Central Coast Region, with a particular interest in nitrogen biogeochemistry and management. A true and correct copy of Dr. Los Huertos' curriculum vitae is attached hereto as Exhibit 3.

7. Kay Mercer:

Kay Mercer is the owner of KMI, a consulting firm that delivers services to assist and advise the agricultural community with management and production improvements to protect water and natural resources within the geographic boundaries of the Central Coast Regional Water Quality Control Board (Central Coast Water Board). A true and correct copy of Ms. Mercer's resume is attached hereto as Exhibit 4.

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8. Lowell Zelinski, Ph.D.:

Lowell Zelinski, Ph.D., is the owner of Precision Ag Consulting, which provides agronomic and nutrient management consulting services to agriculture in the Central Coast Region and in the San Joaquin Valley. Dr. Zelinski has over 30 years of experience in the field of agricultural and soil sciences. A true and correct copy of Dr. Zelinski's resume is attached hereto as Exhibit 5.

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DATED: August 27, 2012

By: _____
Theresa A. Dunham, Attorneys for Petitioners Grower-Shipper Association of Central California, Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties, and Western Growers

CALIFORNIA FARM BUREAU FEDERATION

DATED: August 27, 2012

By: _____
Kari E. Fisher, Attorneys for Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau

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EXPERIENCE SYNOPSIS

- **More than 22 years of experience in the fields of marine, estuarine, and freshwater ecotoxicology (sediments *and* water column), contaminant fate studies, monitoring programs, and project QA oversight.**
- **Extensive experience in sediment toxicity issues; has performed numerous sediment studies including solid-phase, liquid-suspended-phase (elutriate), sediment porewater, sediment TIEs, and *developed* intact sediment core (sediment-water interface) testing approaches.**
- **Experience in directing large-scale environmental projects, including management of multi-subcontractor teams.**
- **Served as Pacific EcoRisk Laboratory Director and Lab QA Officer.**
- **Expert in water quality regulatory issues and has worked with several major California regulatory agencies refining regulatory programs.**

Employment in Years (Current and Past):

Pacific EcoRisk	13 years
U.C. Davis	6 years
U.C. Santa Cruz	3 years
Cal. Fish & Game	2 years

Education:

Ph.D., EcoToxicology, 2013 (expected)

B.S., Biology, 1990

SELECTED PROJECTS:

Sacramento Stormwater Program – Project Manager providing Pacific EcoRisk coordination and consulting to the team involved with sampling of water for stormwater runoff monitoring required under a NPDES permit. Developed the Biological Assessment Monitoring Plan in close coordination with the staff from the Central Valley Regional Water Quality Control Board and Department of Fish and Game. Managed the toxicity testing, including TIE study designs, for both stormwater runoff and dry season samples.

Salinas Stormwater Monitoring Program – Project Manager providing client representation, project coordination, and oversight and direction to team of consultants and labs involved with sampling of water for stormwater runoff monitoring required under a NPDES permit. Developed the Quality Assurance Project Plan, Biological

Assessment Monitoring Plan, and Event-Based Monitoring Plans in close coordination with the staff from the City of Salinas and the Central Coast Regional Water Quality Control Board. Manage the toxicity testing study, including TIE study designs, for both stormwater runoff and dry season samples, as well as analytical lab oversight.

Westside San Joaquin River Watershed Coalition – Project Manager providing oversight and direction for biological and analytical subcontactors for Agriculture Waiver Monitoring. Generated study documents, including the Quality Assurance Study Plan (QAPP), Field Sampling Manual, and event-specific sampling plans. Provided training session for field sampling teams. Consulted with Coalition Watershed Coordinator and Regional Water Quality Control Board staff regarding technical issues for both chemical and toxicological analyses. Designed and performed forensic Toxicity Identification Evaluations (TIE) on toxic samples collected during irrigation and stormwater season.

Cooperative Monitoring Program – Project Manager providing oversight and direction for field sampling, and biological and analytical subcontactors for Central Coast Agriculture Waiver Monitoring. Generate study documents, including the Quality Assurance Study Plan (QAPP) and event-specific sampling plans. Manage the collection of irrigation and stormwater season samples for both water and sediment testing, and bioassessment analyses. Provide consulting services to the Central Coast Cooperative Monitoring Program Executive Director, Technical Program Manager, and Ag Committee, including meetings with Regional Water Quality Control Board staff.

Sacramento Valley Water Qualiy Coalition – Project Manager providing oversight and direction for biological and analytical subcontactors for Agriculture Waiver Monitoring. Provided training session for field sampling teams. Consulted with Coalition Watershed Coordinator and Regional Water Quality Control Board staff regarding technical issues for both chemical and toxicological analyses. Designed and performed forensic Toxicity Identification Evaluations (TIE) on toxic samples collected during irrigation and stormwater season.

Sacramento River Watershed Program – Project Manager providing oversight and direction to sampling, biological and analytical subcontactors for comprehensive watershed study from Pit River above Shasta River to Sacramento River below the city of Sacramento. Coordination with a variety of agencies, including the Central Valley Regional Water Quality Control Board and California Department of Fish and Game, to augment the agencies monitoring activities. Designed and performed forensic Toxicity Identification Evaluations (TIE) on toxic samples collected during irrigation and stormwater season.

NPDES Permit Required Monitoring – Laboratory Director for numerous NPDES permittees, provide testing and monitoring services, forensic Toxicity Identification Evaluation (TIE) study designs, and client representation with staff from the Central Valley, San Francisco Bay, and North Coast Regional Water Quality Control Boards.

Department of Water Resources – Special Project Director for toxicity testing study design, oversight of routine testing, development of forensic TIE studies, and worked directly with the Department of Water Resources study manager for the Federal Energy Regulatory Commission re-certification of the Oroville Dam. Similar services provided in support of study providing data in support of new reservoir development studies.

US Navy CLEAN Projects in San Francisco Bay - Laboratory Director (biological testing and consulting component) for numerous sediment studies conducted as part of US Navy base closure, including studies at Port Chicago Naval Weapons Station, Alameda, Mare Island, and Pt. Molate.

Bay Protection Toxic Cleanup Program – Staff Toxicologist (biological testing) for a multi-year study of West Coast estuaries, bays, and sloughs aimed at identifying "toxic hotspots" as a regulatory approach to implement long-term remediation of contaminated sites.

Marine Bioassay Program – Scientist (biological testing) for a multi-year study developing toxicity testing methods for marine and estuarine species resident to the West Coast of the US. Methods later promulgated by the U.S. EPA.

Railroad Dunsmuir Cantera VAPAM Spill – Scientist directly involved with testing the effects of a pesticide spill in the Upper Sacramento River on rainbow trout. Included testing of contaminated ambient water, pesticide product, and pesticide breakdown product.

Toxicity Assessment of Central Valley Rice Runoff – Scientist testing the effects of rice herbicides and ambient runoff from California Central Valley rice fields on the survival and growth of striped bass and a freshwater mysid. Methods were non-routine, and required modifications to other published testing methodologies.

Sonoma County Water Agency – Special Projects Director (biological testing and consulting) for a year-long sediment study of Hudeman Slough, which included some preliminary sediment TIE approaches.

US Air Force BRAC Projects in Northern California – Laboratory Director (biological testing component) for sediment studies conducted as part of the US Air Force Base Re-Alignment and Closure Program, including MacClellan Air Force Base (Sacramento CA).

PUBLICATIONS:

Werner I., Clark S.L., and Hinton D.E. 2003. Biomarkers aid understanding of aquatic organism responses to environmental stressors. *California Agriculture*: 57(4): 110-114.

Clark, S.L., S.J. Teh, and D.E. Hinton. 2000. Tissue and cellular alterations in Asian clam (*Potamocorbula amurensis*) from San Francisco Bay: toxicological indicators of exposure and effect? *Mar. Env. Res.* 50:301-305.

Clark, SL, V Connor, J Cooke, C Foe, J Bruns, B Croyle, S Moford, and S Yee. 1998. Metal concentrations, loads, and toxicity assessment in the Sacramento/San Joaquin Delta Estuary: 1993-1995. Staff Report, Standards, Policies and Special Studies Unit, Central Valley Regional Water Quality Control Board, October 1998.

Teh, SJ, SL Clark, CL Brown, SN Luoma, and DE Hinton. 1998. Enzymatic and histopathologic biomarkers as indicators of contaminant exposure and effect in Asian clam (*Potamocorbula amurensis*). In: Proceedings of Bivalve Biomarker Workshop, A. Ringwood (ed.), National Oceanographic and Atmospheric Administration, Charleston, South Carolina. March 19-21.

Ferry, L A, SL Clark, and GM Cailliet. 1997. Food habits of spotted sand bass (*Paralabrax maculatofasciatus*) from Bahia De Los Angeles, Baja California. *Bull. South. Calif. Acad. Sci.* 96(1):1-21.

Bailey, HC, SL Clark, J Davis, and L Wiborg. 1996. The effects of toxic contaminants in waters of the San Francisco Bay and Delta. Bay/Delta Oversight Council, Sacramento, CA, 136 pp

PRESENTATIONS:

Clark, S.L. & S. Ogle, Pacific EcoRisk, T. Albertson, Caltest Analytical, C. Harbourt & G. Hancock, Waterborne Environmental, G. Mitchell, FMC Agricultural Products, A. Barefoot & D.M. Tessier, DuPont Crop Protection, M. Dobbs, Bayer CropScience, and P. Hendley & K. Henry, Syngenta Crop Protection. 2012. A comprehensive study of pyrethroids in the American River: Information Learned to Date. 22nd Annual Meeting of the NorCal Society of Environmental Toxicology and Chemistry, May 3, Berkeley, CA.

Clark, S.L., S. Ogle, and J. Cotsifas. 2011. Control treatment water selection can affect the findings of toxicity for *Selenastrum capricornutum* toxicity tests: a source of false positives? 32nd Annual Meeting of the Society of Environmental Toxicology and Chemistry North America, Boston, MA.

Clark, S.L., S. Ogle, and J. Cotsifas. 2011. An Overview of the State Water Board Policy for Toxicity Assessment and Control: Revisions to Regulatory Toxicity Testing Requirements. Invited Speaker for the Annual Northern Regional Training Conference for the California Water Environment Association, September 23, Redding, CA.

Clark, S.L., J. Cotsifas, and S. Ogle. 2009. ABCs of TIEs and TREs, including *Selenastrum* methods. Invited Speaker for the 81st Annual Meeting of the California Water Environment Association, April 28-30, Palm Springs, CA.

Clark, S.L., J. Cotsifas, and S. Ogle. 2008. ABCs of TIEs and TREs. Invited Speaker for the 80th Annual Meeting of the California Water Environment Association, April 13-16, Sacramento, CA.

Clark, S.L., J. Cotsifas, and S. Ogle. 2007. Chronic Toxicity Testing: New Challenges for NPDES Permittees. Invited Speaker for the 79th Annual Meeting of the California Water Environment Association, April 17-20, Ontario, CA.

Clark, S.L., J. Cotsifas, and S. Ogle. 2004. Is Your Effluent Sample Toxic? Using US EPA Criteria and a Thorough QA/QC Review to Properly Evaluate Your Toxicity Data. Invited Speaker for the Northern Regional Training Conference of the California Water Environment Association, September 14, Sparks, NV.

Clark, S.L., J. Cotsifas, and S. Ogle. 2004. ABCs of TIEs. Invited Speaker for the 76th Annual Meeting of the California Water Environment Association, April 27-30, Fresno, CA.

Clark, S.L., C.A. Pincetich, and D. Denton. 2003. Basic Aquatic Toxicity Testing Methods for the Educator and Community-Based Watershed Organizations. 24th Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 9-13, Austin, TX.

Clark, S.L., S. Ogle, and J. Cotsifas. 2003. NPDES Receiving Water Monitoring: Application of the TRIAD Approach to Identify Ambient Water Toxicity from Unknown Causes. 24th Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 9-13, Austin, TX.

Torbitt, A.B., R.S. Ogle, S.L. Clark, and J. Cotsifas. 2003. Sediment Water Interface Testing Using the Chronic *Ceriodaphnia dubia* Test: Implications of Fluridone Exposure in Multi-Phase Environments. 24th Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 9-13, Austin, TX.

Clark, S.L., J. Cotsifas, and S. Ogle. 2003. Transitions from the 4th to 5th Edition for Acute Toxicity Bioassays**.** Invited Speaker for the Redwood Chapter of the California Water Environment Association, October 30**,** Benicia, CA.

Clark, S.L., J. Cotsifas, and S. Ogle. 2003. Understanding Toxicity Testing Methods: the ABCs of TIEs and Changes in Acute and Chronic Toxicity Testing Protocols.

Invited Speaker for the Santa Clara and San Francisco Bay Chapter of the California Water Environment Association, September 17, Berkeley, CA.

Clark, S.L., J. Cotsifas, and S. Ogle. 2003. Transitions from the 4th to 5th Edition for Acute Toxicity Bioassays. Invited Speaker for the Northern Regional Training Conference of the California Water Environment Association, September 9, Tahoe, CA.

Clark, S.L., J. Cotsifas, and S. Ogle. 2003. Whole Effluent Toxicity Testing: Changes in Methods and Regulatory Approaches. Invited Speaker for the Northern San Joaquin Valley Chapter of the California Water Environment Association, May 21, Los Banos, CA.

Ogle R.S., A. Gunther, P. Salop, D. Bell, J. Gold, J. Cotsifas, and S.L. Clark. 2003. Ambient water toxicity in San Francisco Bay: 1993-2002. Presented at the San Francisco Estuary RMP Annual Meeting, Berkeley, CA, May 6, 2003.

Clark, S.L., D. Denton, and C.A. Pincetich. 2002. Basic Aquatic Toxicity Testing Methods for the Educator and Community-Based Watershed Organizations. 23rd Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 16-20, Salt Lake City, UT.

Clark, S.L., J. Cotsifas, and S. Ogle. 2002. Emerging Issues in Whole Effluent Toxicity Testing. 74th Annual Meeting of the California Water Environment Association, April 2-5, Sacramento, CA.

Cotsifas, J., S.L. Clark, and S. Ogle. 2002. Effluent Toxicity Species Screening and Variability Studies: Implementation and Interpretation. 74th Annual Meeting of the California Water Environment Association, April 2-5, Sacramento, CA.

Clark, S.L., D. Denton, and C.A. Pincetich. 2001. Basic Aquatic Toxicity Testing Methods for the Educator and Community-Based Watershed Organizations. 22nd Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 11-15, Baltimore, MD.

Clark, S.L., D. Denton, and C.A. Pincetich. 2000. Basic Aquatic Toxicity Testing Methods for the Educator and Community-Based Watershed Organizations. 21st Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 12-16, Nashville, TN.

Clark, S.L. 2000. Update of Monitoring Activities of the Sacramento River Watershed Program. Sacramento River Watershed Program General Stakeholders Meeting, October 12, Chico, CA.

Pincetich, C.A. and S.L. Clark. 2000. Fun for all: a laypersons guide to toxicity testing – Short Course. 10th Annual Meeting of the Northern California Chapter of SETAC, April 9-10, Davis, CA.

Clark, S.L. S.J. Teh, and D.E. Hinton. 1999. Tissue and cellular alteration in Asian clam (*Potamocorbula amurensis*) from San Francisco Bay: toxicological indicators of exposure/effect? 20th Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 14-18, Philadelphia, PA.

Clark, S.L., C.A. Pincetich, and D.E. Hinton. 1999. Large scale application of an aquatic toxicology bioassay for high school students: can environmental education curricula produce quality data? 20th Annual Meeting of the Society of Environmental Toxicology and Chemistry, November 14-18, Philadelphia, PA.

Clark, S.L. and D.E. Hinton. 1999. Tissue and cellular alteration in Asian clam (*Potamocorbula amurensis*) from San Francisco Bay: toxicological indicators of exposure/effect? 2nd International Symposium on Ecosystem Health, July, Sacramento, CA.

Clark, S.L., I. Werner, D. Cain, B. Lee, and D. E. Hinton. 1998. Cadmium-induced physiological alterations and biomarker responses in Asian clam, Potamocorbula amurensis. 11th Annual UC Toxic Substances Research and Teaching Program Research Symposium, April 24-25, Berkeley, California.

Clark, S.L. and D.E. Hinton. 1998. Histopathology as a biomarker in the Asian clam, Potamocorbula amurensis. 8th Annual NIEHS Fall Symposium, October 15-16, Davis, CA.

Clark, S.L. 1998. Do associations exist between lesions in Asian clam reproductive tissue and anthropogenic stress in San Francisco Bay? Inter-Agency Ecological Program Review Meeting, September, Davis, CA.

Clark, S.L., I. Werner, D.J. Cain, B. Lee, and D. E. Hinton. 1998. Cadmium-induced physiological alterations and biomarker responses in Asian clam, Potamocorbula amurensis. 8th Annual Meeting of the Northern California Chapter of the Society of Environmental Toxicologists and Chemists, June 22-23, Reno, Nevada.

Clark, S.L., I. Werner, S.J. The, and D.E. Hinton. 1997. Histopathology, metallothionein, stress proteins, and enzyme- and immunohistochemistry as biomarkers for cadmium exposure in Asian clam, Potamocorbula amurensis. 18th Annual Meeting of the Society of Environmental Toxicology and Chemistry, San Francisco, CA.

Werner, I., S.L. Clark, S.J. The, and D.E. Hinton. 1997. Field validation of biomarkers in Asian clam (Potamocorbula amurensis) collected along a contamination gradient in Northern San Francisco Bay. 18th Annual Meeting the Society of Environmental Toxicology and Chemistry, San Francisco, CA November 16-20.

Clark, S.L. 1997. Future directions for watershed toxicity monitoring: Incorporating measurements of sublethal effects in resident species. Presented at the State of the Watershed Conference, Sacramento, CA, October 9.

Clark, S.L., I. Werner, S.J. The, and D.E. Hinton. 1997. Biomarkers in Asian clam (Potamocorbula amurensis). 7th Annual Meeting of the Northern California Society of Environmental Toxicology and Chemistry, San Francisco, CA, June 2.

Clark, S.L., I. Werner, S.J. The, and D.E. Hinton. 1997. Biomarkers in Asian clam (Potamocorbula amurensis): linkage of population level effects to toxicant stress in San Francisco Bay. 10th Annual UC Toxic Substances Research and Teaching Program Research Symposium, San Diego, CA, April 11-12.

Clark, S.L., L.A. Deanovic, H.C. Bailey, J.L. Miller, M.J. Miller, V.M. Connor, and D.E. Hinton. 1996. Toxicity identification evaluation procedures for the freshwater algae, Selenastrum capricornutum. Presented at the 17th Annual Meeting Society of Environmental Toxicology and Chemistry, Washington, D.C., November 17-21.

Clark, S.L., L.A. Deanovic, H.C. Bailey, J.L. Miller, M.J. Miller, V.M. Connor, and D.E. Hinton. 1996. Toxicity identification evaluation procedures for the freshwater algae, Selenastrum capricornutum. Presented at the 6th Annual Meeting of the Northern California Society of Environmental Toxicology and Chemistry, Sacramento, CA, June 24-25.

PROFESSIONAL AFFILIATIONS:

American Chemical Society

California Water Environment Association

California Water Environment Association, San Francisco Bay Chapter

California Water Environment Association, Redwoods Chapter

North America Society of Environmental Toxicology and Chemistry
- Member, Education Committee (2003 – present)
- Member, Regional Chapter's Committee (2003)

Northern California Chapter, Society of Environmental Toxicology and Chemistry
- President (2003)
- Vice President (2002)
- Board of Directors (2001-2004)

Water Environment Federation

COMMUNITY INVOLVEMENT:

City of Stockton Sports Commission
- Board Member (2007 - 2011)

Stockton Youth Soccer Association
- President (2007 - 2011)
- Board Member (1999 - 2011)
- Traveling Program Girls Soccer Coach (2002 - 2008)
- Recreational Program Soccer Coach (1994 – 2007)
- Referee (1994 – present)

Stockton Storm Futbol Club (Traveling Soccer Program)
- President (2008-2011)
- Traveling Soccer Coach (2008-present)

Quail Lakes Baptist Church, Youth Ministry
- Kids Church Leader (1996 – present)
- Summer Program Ministry Team (1998 – present)

Michael Johnson, Ph.D.

President, MLJ-LLC

Education

Ph.D., Ecology, University of Kansas, 1984

M.A., Environmental, Population, and Organismal Biology, University of Colorado, 1977

B.A., Environmental, Population, and Organismal Biology, University of Colorado, 1974

Background

Dr. Johnson began his career at the University of Kansas performing water quality research in mixed use watersheds in the Kansas, Iowa, and Nebraska. Dr. Johnson has worked at the University of California, Davis since 1992 beginning as a Research Scientist in the Department of Civil and Environmental Engineering. He joined the Center for Watershed Sciences in the John Muir Institute of the Environment in 1998 and also joined the Department of Medicine and Epidemiology in the School of Veterinary Medicine as an Adjunct Professor. Dr. Johnson retired from the University in June 2010.

Dr. Johnson has spent the last 18 years performing monitoring and research on water quality issues in California, and has been involved in water quality issues throughout the Central Valley and North Coast. Dr. Johnson has extensive experience developing innovative tools to assist in identifying sources of discharge of numerous constituents to surface waters. He has managed numerous water quality monitoring projects for the Regional Board addressing constituents such as salt, nutrients, and pesticides including Ag Waiver and TMDL projects.

Through MLJ-LLC, Dr. Johnson is the technical lead for two agricultural coalitions in the San Joaquin Valley and manages numerous other monitoring projects. He sits on a number of technical advisory boards, work groups, and task forces including the Delta Regional Ecosystem Implementation Plan team, the State of California Sediment Quality Objectives work group, CV-SALTS Technical Advisory Committee, and the Irrigated Lands Regulatory Program Technical Issues Committee. While engaged in these activities, he has worked with numerous state and federal agencies, nongovernmental organizations, environmental groups, and private industry.

Relevant Experience

Agricultural Waiver Monitoring – Phase II and Pesticide TMLD Programs, Central Valley, California, Central Valley Regional Water Quality Control Board – Dr. Johnson developed the monitoring programs for the Central Valley Regional Water Quality Control Board including the collection of samples, the statistical analysis of the data, and the reporting to the Regional Board. Data collected were field parameters including EC, physical parameters including TDS, toxicity and water chemistry. The program was instrumental in allowing the Regional Board to develop and focus the Irrigated Lands Regulatory Program for agricultural coalitions and irrigation districts in the Central Valley. Additionally, monitoring for the TMDL program is guiding the development of pesticide TMDLs for the region. Dr. Johnson worked closely with Regional Board staff during these projects addressing the concerns of both regulators and stakeholders.

Irrigated Lands Regulatory Program Coalition Monitoring, Contra Costa, San Joaquin, Stanislaus, Merced, and Madera Counties, California, East San Joaquin Water Quality Coalition and San Joaquin County and Delta Water Quality Coalition – Dr. Johnson is the technical program manager and technical lead for monitoring and reporting programs for two agricultural coalitions in the San Joaquin Valley. The programs involve monitoring for numerous constituents including toxicity, pesticides, nutrients, and salts (EC and TDS).

As technical program manager, Dr. Johnson regularly meets with Regional Board staff to update them on Coalition monitoring, data interpretation, and outreach, and is involved in technical and policy discussions between the coalitions to other stakeholders in the region including several irrigation districts, the dairy industry, and agricultural industry suppliers. As part of his responsibilities, Dr. Johnson is a member of the ILRP Technical Issues Committee which provides scientific rationale for monitoring and interpreting the data generated by Coalitions across the valley. He is also part of the CV SALTS process, participating in technical discussions with the CVSALTS Technical Advisory Committee and CV SALTS stakeholders.

Mosquito Vector Control Association of California, California Central Valley – In an ongoing project MLJ-LLC provides support to MVCAC monitoring activities pursuant to their NPDES permit requirements.

PAST POSITIONS

Research Scientist, Center for Watershed Sciences, John Muir Institute of the Environment, 2008-2010
Adjunct Associate Professor, Department of Medicine and Epidemiology, School of Veterinary Medicine, 2004-2010
Associate Research Scientist, John Muir Institute of the Environment, 1998-2006
Director, Lead Campus Program in Ecotoxicology, UC Toxic Substances Research & Teaching Program, 2000-2005
Associate Researcher, Department of Civil and Environmental Engineering, 1992-1998
Lecturer, Department of Environmental Toxicology, 1998-1999
Lecturer, Department of Wildlife, Fish, and Conservation Biology, UC Davis, 1993-1995
Assistant Scientist, Kansas Biological Survey, 1991-1992
Adjunct Assistant Professor, Department of Systematics and Ecology, University of Kansas, 1989-1992
Research Associate, Kansas Biological Survey, 1988-1991
Postdoctoral Research Associate, Department of Systematics and Ecology, University of Kansas, 1987-1988
Lecturer, Department of Mathematics, University of Kansas, 1984-1987

PROFESSIONAL ACTIVITIES

Reviewer - American Naturalist; Ecology; Southwestern Naturalist, Canadian Journal of Zoology; Journal of Insect Behavior; Trends in Ecology and Evolution; American Midland Naturalist; Journal of Mammalogy; Journal of Wildlife Management; Environmental Toxicology and Chemistry - Special Publication, Bulletin of Environmental Contamination and Toxicology, Biological Conservation, Office of Environmental Health Hazard Assessment Public Health Goals Draft Documents, several book chapters and symposia contributions.

Consultant - Coastal Salt Marsh Recovery Team (formerly the California Clapper Rail and Salt Marsh Harvest Mouse Endangered Species Recovery Team); U.S. Navy for Ecological Risk Assessment at Mare Island Naval Shipyard; U.S. Fish and Wildlife Service for Natural Resource Damage Assessment; Alameda Point Restoration Advisory Board for Ecological Risk Assessment at Alameda Point (formerly Alameda Naval Air Station), US Air Force for Ecological Risk Assessment at Edwards Air Force Base, USFWS Consultant Team for Delta Smelt Biological Opinion.

COURSES TAUGHT

Ecotoxicology (ETX 240) – 2008
Mammalogy (WFCB 110, 110L) – 1993-1995
Introduction to Toxicology (ETX 10) – 1998-1999
Ecological Risk Assessment (UNEX) – 1995, 1997
Health and Ecological Risk Assessment (with T. Carpenter) – 1997, 1999, 2000, 2002-2007, 2009
Problems in Ecotoxicology, (Summer Short Course) – 2002

GRANTS AND CONTRACTS

University of California (All grants as Principle Investigator unless noted otherwise)

Identifying pharmaceuticals in the Sacramento River. State Water Resources Control Board. June 2007 – March 2011 ($20,037)

Review of ammonia in the Delta. State Water Resources Control Board. June 2008 – March 2010 ($40,697)

Identifying pharmaceuticals in the Napa River and tributaries. Napa Sanitation District. November 2008 – June 2010 ($75,000)

Pelagic Organism Decline. State Water Resources Control Board. June 2008 – March 2010 ($450,000)

QAPP development for permitting operations. California Urban Water Agency. July 2008 – September 2008 ($8,835)

Identifying pharmaceuticals in Sonoma Creek and tributaries. Sonoma County Water Agency. April 2007 – June 2009 ($75,000)

Regional Data Center – California Environmental Data Exchange Network. State Water Resources Control Board. May 2007 – present ($299,500)

Evaluation of the toxicity of biodiesel fuels. California Air Resources Board. June 2007 – June 2009 ($185,000)

Effect of Light Brown Apple Moth pheromones on honey bees. California Department of Food and Agriculture. December 2007 – December 2009 ($187,425)

Guidance Document and Recommendations on the Types of Scientific Information to be Submitted by Applicants for California Fuels Environmental Multimedia Evaluations. California Air Resources Board. June 2007 – May 2009 ($55,110)

Phase II Continuation of Monitoring of Agricultural Drainage Water Quality in the Central Valley of California. CAL EPA Water Control Board. December 2003 – June 2008 ($2,337,837)

City of Ukiah Healthy Waterways Study. City of Ukiah. July 2006 – December 2008 ($35,000)

Review & Assessment of Apalachee I BMPs and Monitoring Needs, Task 2. El Dorado County. November 2004 – January 2009 ($17,472)

Review & Assessment of Apalachee I BMPs and Monitoring Needs, Task 3. El Dorado County. November 2004 – January 2005 ($17, 472)

Identification of Bacterial Sources for the East San Joaquin Water Quality Coalition. East San Joaquin Water Quality Coalition. July 2006 – December 2006 ($7,123)

Bacterial Source Identification Analysis. East San Joaquin Water Quality Coalition. April 2007 – June 2008 ($16,673)

Identification of Bacterial Sources for the Sacramento Valley Water Quality Coalition. July 2006 – December 2007 ($6,600)

Lake County Healthy Waterways Study. Lake County. August 2005 – February 2008 ($34,500)

Detection of Fecal Contaminants in Groundwater. Lake County. March 2007 – December 2008 ($6,840)

Scientific Peer Review of Public Health Goal Documents. CAL EPA – Office of Environmental Health Hazard Assessment. July 2005 – August 2005 ($3,000)

Feather River PRISM. Coalition for Urban/Rural Environmental Stewardship. January 2005 – January 2008 ($70,000)

Feather River Prop 50 Monitoring and Modeling. California State Water Resources Board. November 2005 – December 2007 ($143,331)

Identification of Bacterial Sources for the San Joaquin County & Delta Water Quality Coalition. San Joaquin County and Delta Water Quality Coalition. July 2006 – December 2006 ($7,300)

Tahoe Basin Toxicity Testing. California Department of Transportation. October 2005 – May 2008 ($6,281)

Total Maximum Daily Load Monitoring. State Water Resources Control Board. March 2007 – February 2008 ($139,500)

Central Valley Bioassessment 2005-06. Central Valley Regional Water Quality Control Board. December 2005 – December 2006 ($276,048)

El Dorado County Department of Transportation Sampling and Analysis of Water Runoff. Eldorado County Department of Transportation. February 2004 – February 2008. ($475,000)

Using a sensitive Japanese Medaka (*Oryzias latipes*) fish model for the detection of endocrine disruptors in ground water. State Water Resources Control Board. June 2004 – May 2006 ($238,000) (Co-PI, S. Teh PI)

Central Valley Bioassessment 2004-05. Central Valley Regional Water Quality Control Board. April 2004 – June 2005 ($228,000)

Using a sensitive Japanese Medaka (*Oryzias latipes*) fish model for endocrine disruptors screening. U.S. Environmental Protection Agency. October 2003 – September 2006 ($399,167) (Co-PI, S. Teh PI)

Fire and fuels management, landscape dynamics, and fish and wildlife resources: study design for integrated research on the Plumas and Lassen National Forests -- Small mammal distribution, abundance, and habitat relations. USDA-Forest Service, 2002-2007. ($1,604,000); (Co-PI, D. Kelt PI)

TMDL monitoring of Central Valley Watersheds 2002-03. Central Valley Regional Quality Control Board. December 2002 – August 2003 ($340,147)

Review of Angora Meadows Monitoring Data. El Dorado County. March – May 2003 ($2,061)

Ecotoxicology Lead Campus Program. UC Toxic Substances Research and Teaching Program. June 2000 – June 2004 ($1,266,594)

Central Valley Bioassessment 2003-04. Central Valley Regional Water Quality Control Board. June 2003 – June 2004 ($186,620)

Review of Public Health Goals Draft Documents for 1,1,2,2-Tetrachloroethane, Chlorobenzene, Simizine, and 1,1-Dichloroethane. Office of Environmental Health Hazard Assessment, Cal EPA. December 1998 – January 2003. ($6,000)

Review of SFBRWQCB Risk Based Screening Levels for Ecological Receptors. UC Berkeley. April 2003 – June 2003 ($2,000)

Water quality modeling for the Shasta River dissolved oxygen and temperature TMDLs. North Coast Regional Water Quality Control Board. December 2003 – December 2004, ($115,000) Co-PI, (J. Quinn, PI)

TMDL monitoring of Central Valley Watersheds 2003-04. Central Valley Regional Water Quality Control Board. November 2003 – March 2004, ($259,973)

Statewide toxicity testing research project. California Department of Transportation. June 2000 – June 2003 ($1,710,000)

Simplex modeling of an urban watershed. Vallejo Sanitation and Flood Control District. August 2000 – August 2001 ($29,000)

Perchlorate exposure in drinking water. California Department of Health Services. (Co-PI, G. Fogg, P.I.) June 1999 – September 2001 ($222,603)

FREP project. California Department of Food and Agriculture. February 2000 – March 2000 ($4,000)

Estrogenicity of selected herbicides and adjuvants. California Department of Transportation. October 1998 – June 2002 ($241,627)

Simplex modeling of an urban watershed. Fairfield-Suisun Sewer District. December 2000 – December 2001 ($10,000)

MTBE analysis in California. University of California Toxic Substances Research and Teaching Program (Co-PI). January 1998 – October 1998 ($220,000)

TMDL analysis of North Coast watersheds (North Coast River Loading Study). California Department of Transportation. July 1997 – June 2002 ($1,541,173)

The impact of stormwater runoff on North Coast rivers (Small Stream Crossing Study). California Department of Transportation. November 1997 – June 2002 ($1,820,144)

San Pablo Bay National Wildlife Refuge vegetation monitoring plan. California Department of Transportation. July 1997 – June 2002 ($419,250)

Small mammal survey of the Alhambra Creek Wetlands. California Department of Transportation. September 1997 – October 1997 ($12,000)

Baseline vegetation survey of the East San Pablo Bay Unit of the San Pablo Bay National Wildlife Refuge. California Department of Transportation. July 1996 – March 1997 ($50,000)

An integrated assessment of a linked wetland-nearshore estuarine ecosystem at Mare Island Naval Shipyard. University of California Toxic Substances Research and Teaching Program. July 1996 – June 1997 ($363,000)

An integrated assessment of a linked wetland-nearshore estuarine ecosystem at Mare Island Naval Shipyard. University of California Toxic Substances Research and Teaching Program. July 1995 – June 1996 ($160,000)

An integrated approach to assessing water management options in a major watershed: Extending a hydrodynamic-water quality model to include biological and politico-economic components (Co-PI). U.S. Environmental Protection Agency (EPA-NSF). October 1996 – September 1999 ($1,292,627)

Development of an ecological risk assessment model. Year 2. California Environmental Protection Agency. July 1995 – June 1996 ($40,000)

Salt marsh hydrology and mitigation of flooding. California Department of Transportation. October 1995 – June 1996 ($50,000)

Salt marsh modeling. National Biological Survey. November 1994 – October 1995 ($59,325)

UC Davis Environmental Education Partnership (UCDEEP). (Co-PI) Department of Defense. October 1994 – September 1995 ($1,660,207)

An integrated ecological assessment of three wetlands sites at Mare Island Naval Shipyard. University of California Toxic Substances Research and Teaching Program. July 1994 – June 1996 ($79,453)

Development of an ecological risk assessment model and symposia. California Environmental Protection Agency. July 1994 – June 1995 ($250,000)

A regionalized assessment of the influences of rural nonpoint source pollution on the ecological integrity of stream ecosystems and evaluation of associated pollution control management: Data management and data analysis (Year 2). Subcontract to University of Kansas. June 1993 – June 1994 ($23,000)

Hydrodynamic modeling of Pt. Mugu Lagoon. U.S. Fish and Wildlife Service. August 1993 – December 1993 ($5,000)

Feasibility study of alternate wetland restoration plans for the Napa Marsh Unit of the San Pablo Bay National Wildlife Refuge. U.S. Fish and Wildlife Service. January 1993 – December 1994 ($85,286)

A regionalized assessment of the influences of rural nonpoint source pollution on the ecological integrity of stream ecosystems and evaluation of associated pollution control management. Phase I. Selection of watersheds. U.S. EPA, Region IX. August 1992 – June 1993 ($29,000)

An assessment of the effects of nonpoint source pollution on the biotic integrity of Walnut Creek, and the role of riparian vegetation in mitigating nonpoint source pollution: Data management and data analysis. Subcontract to University of Kansas. October 1992 – September 1995 ($35,443)

A regionalized assessment of the influences of rural nonpoint source pollution on the ecological integrity of stream ecosystems and evaluation of associated pollution control management: Data management and data analysis (Year 1). Subcontract from the University of Kansas. June 1992 – June 1993 ($23,000)

University of Kansas

Data for validation of EPA modeling. U.S. EPA - ERL Duluth. August 1990 – March 1991 ($7500)

A regionalized assessment of the influences of rural nonpoint source pollution on the ecological integrity of stream ecosystems and evaluation of associated pollution control management (Year 1). U.S. EPA. June 1991 – June 1992 ($1,250,000)

A regionalized assessment of the influences of rural nonpoint source pollution on the ecological integrity of stream ecosystems and evaluation of associated pollution control management (Year 2). U.S. EPA. June 1992 – June 1993 ($1,450,000)

An assessment of the effects of nonpoint source pollution on the biotic integrity of Walnut Creek, and the role of riparian vegetation in mitigating nonpoint source pollution. U.S. EPA. August 1992 – July 1995 ($325,000)

PRESENTATIONS (Poster and Oral)

LeDoux-Bloom, C. M., J. E. Hemmert, Y. Zhan, **M. L. Johnson**, S. I. Doroshov, B. Wrege, and J. J. Isely. 2012. If we build it, who will come? -Importance of Predator-Prey Habitat Overlap to Restoration. 30th Annual Salmonid Restoration Conference, Davis, CA.

LeDoux-Bloom, C. M., **M. L. Johnson**, S. I. Doroshov, and A. P. Klimley. 2011. Migratory Behavior of Sub-Adult Striped Bass and some factors that may trigger movement through the San Francisco Estuary. 141st Annual Meeting American Fisheries Society Seattle, WA.

LeDoux-Bloom, C. M., T. Sommer, and **M. L. Johnson**. 2010. Effects of suture material on growth, incision healing, and inflammation in sub-adult striped bass implanted with acoustic transmitters. Delta Science Council Conference, Sacramento, CA.

Turner, M. A., J. D. Kiernan, L. Chu, N. Y. Krigbaum, and **M. L. Johnson**. 2007. Effects of two developmental temperatures on lipid composition in steelhead (*Oncorhynchus mykiss*) juveniles. Annual Meeting of the American Society of Fisheries, San Francisco, CA. Sept 2-6, 2007.

Kiernan, J. D., L. Chu, N. Y. Krigbaum, B. N. Harvey, and **M. L. Johnson**. 2007. Mechanisms and pathways linking salmon carcasses to the productivity of a coastal California stream. Annual Meeting of the American Society of Fisheries, San Francisco, CA. Sept 2-6, 2007.

Johnson, M. L. 2006. Water quality in agricultural landscapes in the Central Valley: Is the glass half empty or half full? UC-ANR Surface Water Quality Workshop. Woodland, CA. April 27, 2006.

León-Cardona, A. Teh, S. J., **Johnson, M.**, Hall, L. C. and Wu, P-S. 2006. Gene expression profiling of androgenic and antiandrogenic endocrine disrupting chemicals on Qurt medaka (*Oryzias latipes*) fish. University of California Toxic Substances Research & Teaching Program (UCTSR&TP) 19th Annual Research Symposium. San Diego, California. April 28-29, 2006.

Teh, S., León-Cardona, A., Wu, P-S., Hall, L. C., and **Johnson, M**. 2006. Using a sensitive Japanese medaka (*Oryzias latipes*) fish model for endocrine disruptor screening. 4th Biennial CALFED Bay-Delta Program Science Conference. Sacramento, CA. October 23-25, 2006.

Johnson, M. L., M. Turner, S. Teh, and M. Viant. 2004. NMR analysis of elevated temperature on developing steelhead (*Oncorhynchus mykiss*) eggs. Society of Environmental Toxicology and Chemistry, Portland, OR. November 2004.

Steinmetz, J, **M. Johnson**, R. Bush, H. Calanchini, M. Turner, and J. Viers. 2004. Avian predation in the Navarro River watershed, California: Potential impacts on salmonids. Annual Meeting of the Ecological Society of America, Portland, OR. August 2004.

S. A. Coppeto, D. A. Kelt, J. A. Wilson, D. H. VanVuren and **M.L Johnson**. 2004. Habitat selection by small mammals in the Northern Sierra Nevada, California. 84th American Society of Mammalogists Annual Meeting. Arcata, CA. June 12-16, 2004.

Teh, S., Hall, L., **Johnson, M.**, and Bartosiewicz, M. 2004. Development and application of an endocrine-disruptor (ED) gene chip. Northern California Chapter of the Society of Environmental Toxicology and Chemistry (NorCal SETAC) 14th Annual Meeting. May 12, 2004.

Kiernan, J.D. and **M. L. Johnson**. Using Marine-Derived Nitrogen in Riparian Tree Rings to Assess Nutrient Flux and Salmon Escapement. 22nd Annual Salmon Restoration Federation Conference, Davis, CA. March 20, 2004.

Bowen, L., B. Aldridge, B. DeLong, L. Lowenstein, J. Stott, and **M. Johnson**. 2003. Immunogenetic characterization of the California sea lion (*Zalophus californianus*): a framework for future studies. Poster presented at the 9th International Congress of the International Society for Developmental and Comparative Immunology, St. Andrews, Scotland. 29 June – 4 July 2003.

Bush, R. A., **M. L. Johnson**, and P. B. Moyle. 2003. Estuaries: Migration corridors or essential rearing habitat for steelhead? Western Division of the American Fisheries Society, San Diego, CA. April 2003.

Viers, J.H., Florsheim, J.L., Ramirez, C., Quinn, J.F., **Johnson, M.L.,** and Kozlowicz, B. 2002. Detecting Patterns of Land Use Disturbance at a Watershed Scale: A Study of the Navarro River Watershed using Hyperspectral Data Analysis Techniques. EOS Trans. AGU, 83(47):F273, Fall. Meet. Suppl., Abstract B21A-0710.

M. Turner, D. Huggins, and **M. L. Johnson.** 2002. Assessment of asymmetry in steelhead trout, *Oncorhynchus mykiss*, from a northern California watershed and its potential relationship to environmental stress. Presented at the Bay Area Conservation Biology Symposium. January 2002.

Blanchard, M., B. Aldridge, C. Funke, D. King, T. Goldstein, L. Dalton, L. Bowen, **M. Johnson,** B. Smith, G. Antonelis, J. Stott, F. Gulland, A. Aguirre, R. Braun, J. Reif, and S. Dickerson. 2001. Can Blind Monk Seals Help Us See? Presented at the 14th Biennial Conference on the Biology of Marine Mammals. November, 2001.

Bowen, L., B.Aldridge, J. Stott, W. Van Bonn, F. Gulland, and **M. Johnson.** 2001. California Sea Lions (*Zalophus californianus*) MHC Class II: how classy are there genes? (**)** Presented at the 14th Biennial Conference on the Biology of Marine Mammals. November 2001.

Viers, J. H., C. T. Sailer, C. M. Ramirez, J. F. Quinn, and M. L. Johnson. 2002. An Integrated Approach to the Discrimination of Riparian Vegetation in the Navarro River Watershed, Mendocino County, California, USA JPL Conference. February 2002.

Johnson, M. L. 2001. Simplex Modeling of Urban Watersheds. Inaugural CWEA-WRPPN Pollution Prevention Conference, October 23-26, 2001, Santa Rosa, CA.

Viers, J. H., J. F. Quinn, P. B. Moyle, and **M. L. Johnson.** 2001. Aquatic Conservation in California Coastal Watersheds: Geospatial Information as a Starting Point, Society for Conservation Biology Annual Meeting, Honolulu, HI. June 2001.

Johnson, M. L. 2001. The Simplex Model for Urban Watershed Analysis, Bay Area Stormwater Management Agencies Association. April 4, 2001.

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M.A. Ecology and Systematics, San Francisco State University, 1992.

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Employment

Associate Professor, Division of Science & Environmental Policy, California State University Monterey Bay, August 2011–present.

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Assistant Research Faculty in Agroecology, Social Sciences Division, University of California, Santa Cruz, January 2001–December 2004.

Consulting

Buchanan Associates. Soil fertility and irrigation evaluations; statistical and GIS analyses; and modeling. 2000–present.

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Research

Selected Peer-Reviewed Articles

Schmidt, CS, AT Fisher, A Racz, BS Lockwood, M Los Huertos. In press. Linking Denitrification and Infiltration Rates during Managed Groundwater Recharge. Environmental Science and Technology.

Racz, A., AT Fisher, CS Schmidt, BS Lockwood, M Los Huertos. In press. Spatial and Temporal Infiltration Dynamics during Managed Aquifer Recharge. Groundwater.

Schmidt, CS, AT Fisher, A Racz, C Wheat, M Los Huertos, B Lockwood. In press. Rapid nutrient load reduction during infiltration of managed aquifer recharge in an agricultural groundwater basin: Pajaro Valley, California. Hydrologic Processes.

Dowd, B, D Press, M Los Huertos. 2008. Policy tools, monitoring, and funding to reduce nutrient pollutants: A case study of nitrate in the Pajaro River, California. Agriculture, Ecosystems and Environment 128(3):151-161.

Lemos, RT, B Sanso, M Los Huertos. 2007. Spatially varying temperature trends in a northern California estuarine reserve. Journal of Agricultural, Biological, and Environmental Statistics 12(3):379-396.

Rein, FA, M Los Huertos, KD Holl, JH Langenheim. 2007. Restoring native grasses as vegetative buffers in a coastal California agricultural landscape. Madroño 54(3):249-257.

Ruehl, C, AT Fisher, M Los Huertos, S Wankel, CG Wheat, C Kendall, C Hatch, C Shennan. 2007. Nitrate dynamics within the Pajaro River, a nutrient-rich, losing stream. North American Benthological Society Journal, 26:191-216.

Ruehl, C, AT Fisher, CE Hatch. M Los Huertos, G Stemler, C Shennan.2006. Differential gauging and tracer tests resolves seepage fluxes in a strongly-losing stream. Journal of Hydrology 330:235-248.

Wilcox, C, M Los Huertos. 2005. A simple, rapid method for mapping bathymetry of small wetland basins. Journal of Hydrology 301:29-36.

Los Huertos, M, LE Gentry, C Shennan. 2001. Land use and stream nitrogen concentrations in agricultural watersheds along the central coast of California. IN Optimizing Nitrogen Management in Food and Energy Production and Environmental Protection: Proceedings of the 2nd International Nitrogen Conference on Science and Policy. Scientific World 1.

Other Publications

Li, C, W Salas, M Los Huertos. 2004. Quantifying carbon dynamics and greenhouse gas emissions of agricultural soils of California: A Scoping Study. Kearney Foundation/California Energy Commission. California Department of Food and Agriculture.

Los Huertos, M, C Shennan. 2002. The Soil Resource in Elkhorn Slough.in J. Caffrey and M. Brown, editors. Changes in a California Estuary: A Profile of Elkhorn Slough. Monterey Bay Aquarium Press, Monterey.

Selected Research Grants and Funding Sources

USDA-Organic Agriculture Research and Extension Initiative. (Sept. 2011-Aug. 2015). Global Warming Potential of Row Crop Agroecosystems. $174,199.

Water Quality Preservation, Inc. (January 2011-Dec 2011). Agricultural Waiver Monitoring. $91,325.

CSU-Agricultural Research Initiative (August 2010-July 2012). Global Warming Potential of Contrasting Strawberry Agroecosystems. $66,531.

Water Quality Preservation, Inc. (January 2010-March 2011) Agricultural Waiver Monitoring $97,325.

Water Quality Preservation, Inc. (January 2009-March 2010) Agricultural Waiver Monitoring $93,325.

State Water Resources Control Board (March 2007-December 2011). Developing a Periphyton Index of Biotic Integrity for the Central Coast of California. $660,000

Central Coast Coalition for Water Quality/State Water Resources Control Board (Feb. 2007- 2009) Managing Farmland to protect water quality and food safety 157,000

Monterey County Resource Conservation District (August 2006-July 2008) Evaluation of Vegetative Treatment Systems in Monterey County 169,482

Community Foundation of Monterey/PG& E Settlement Funds (Jan. 2006-December 2011). Design Tools for Treatment Wetland Design $42,026.

Santa Clara Valley Water District/State Water Resources Control Board Best Management Practice Evaluation and Monitoring $36,543

UC Santa Cruz/Santa Cruz Resource Conservation District Evaluation ground and surface water interactions in treatment wetland systems $245,000

Regular Course Teaching

Aquatic Ecology (Bio 448/548), Spring Semester.

Environmental Monitoring (ENVS 355), Fall Semester.

Introduction to Environmental Science (ENVS 201), Spring Semester (usually bought out).

Graduate Seminar I (ENVS 500), Fall Semester.

Graduate Seminar II (ENVS 502), Spring Semester.

Research Methods (ENVS 550), Fall Semester (Co-taught).

Advanced Watershed Science &Policy (ENVS 660), Fall Semester (Co-taught).

Recent Speaker Invitations

Beyond the Reporting Requirements: Management Practices to Improve Water Quality. California Strawberry Commission, Santa Maria and Watsonville, CA. July 11 and 12, 2012.

Regulating Agricultural Runoff. AgKnowledge. Monterey County Farm Bureau. June 15, 2012.

Central Coast Water Quality Regulation. Annual Leafy Greens Research Meetings, Coalinga, CA. Jan. 30, 2012.

Water Quality and Policy Dilemmas in the Agricultural Landscape. A Greater Vision: CSUMB forum on 'Our Shared Legacy - Land and Water. Conference Panel Member and Presenter, California State University Monterey Bay. October 22, 2010.

Professional Activities

Reviewer for Agricultural Systems, 2010-11.

Professional Affiliations

American Water Resources Association 2004-present

Agronomy Society of America 1999-present

Ecological Society of America 1996-present

National Association of College Teachers in Agriculture 2010-present

Last updated: July 18, 2012

Kay L. MERCER

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PROFESSIONAL EXPERIENCE

Summary

- 22 years working in production agriculture in California, Southwestern U.S, and Midwestern U.S.
- 19 years of providing technical training and education using ability to distill complex technical and regulatory issues into key information for non-technical audiences.
- 13 years working in the crop protection and vegetation management industries.
- 8 years experience working with agricultural water quality issues which include implementation of mitigation measures, and evaluation, negotiation, and strategic planning relative to regulation.
- 3 years experience working in the groundwater remediation and environmental analytical industries with an emphasis on DOD, CERCLA, and RCRA regulations.
- Strong analytical, project management and strategic planning skills.
- Broad knowledge of California crops, pests and weeds, IPM and pesticide use patterns**.**

Self-Employment

KMI, President **2005-Present**

Providing consulting services to assist and advice members of the agricultural community with management and production improvements that protect water quality and natural resources.

Contract with Aquatrols

- Conducted a California Market Segmentation Study for IrrigAid Gold, a soil surfactant that assists with water penetration and distribution of water in the soil.

Pro bono work for GSA of Central California and MCFB

- Collaborate with Marc Los Huertos, Cal State University Monterey Bay, and growers members to formulate On-Farm Solutions, a coordinated effort to track management practice effectiveness.

Contract with Individual growers, landowners and consultants

- Identify issues and corresponding solutions and work with growers on problem solving and solution implementation.
- Provide periodic updates of emerging policies, regulations, and technical solutions.

Contract with Ranchers

- Facilitate the Central Coast Cattlemen's Leadership Group to better understand and participate in the Pajaro River Pathogen and Sediment, Lower Salinas Pathogen and Santa Maria Fecal Coliform TMDL programs.
- Create simple fact sheets for Cattlemen, which explain SWRCB and RWQCB regulatory authority and the TMDL process.
- Organize webinars to explore the environmental fate and regulation of human pathogens at the nexus of cattle production, water quality and leafy green food safety and facilitate participation of UCD, UCCE, and the California Cattlemen's Association.
- Update the 1995 Rangeland Water Quality Plan.

- Organize a Rangeland Water Quality Planning Short Course in conjunction with Monterey County Cattlemen's Association
- Attended the Agri-Life Bacterial Source Testing Conference in New Braunfels, Texas, to learn how ranchers might use this tool to be identify sources of fecal coliform in listed waterbodies on the Central Coast

Contract with Farmers for Water Quality

- Conducted grower interviews on financial impact of 2010 and 2011 proposed Central Coast Regional Water Quality Control Board Conditional Ag Waivers.
- Teamed with Cal State University Monterey Bay Economist to utilize grower interview results to determine induced impact of Waiver to Central Coast economy in terms of lost gross income, lost tax revenue, lost jobs, and lost labor income.
- Provided technical and economic analysis of the Ag Alternative Proposed Conditional Ag Waiver.
- Teamed with Cal State University Monterey Bay Watershed Institute to provide further refinement of Ag Alternative Conditional Ag Waiver Proposal.

***Contract with Central Coast Agricultural Water Quality Coalition*, Executive Director**

- Managed a 501c3 corporation with the Mission to represent "farmers and ranchers in voluntary, cost-effective, producer-directed programs to protect water quality" through education, outreach, coordination, facilitation and innovation.
- Restored $620,000 in grant funds lost due to 2008 suspension of Proposition funded grants.
- Conducted four grower surveys to measure grower response to water quality education, grower satisfaction with Coalition services and needs for the future and grower attitudes regarding management practice implementation.
- Incorporated grower survey results, funding opportunities, status of regulatory negotiations and input from water quality partners to create a strategic business analysis and alternative business models for the Central Coast Agricultural Water Quality Coalition.
- In 2009, eliminated staff and reduced overhead in response to lost revenue.
- Managed six contract watershed coordinators and professional support staff to implement $750,000 in federal, state and local grant funds.
- Grant projects managed were
    - Irrigation efficiency and distribution uniformity in grapes, turf, stonefruit, and vegetables,
    - Use of alfalfa trap crops for insect control in strawberries,
    - Development of Landguard, an enzyme which breaks down organophosphate chemicals,
    - Development of Polyacrylamide (PAM) to reduce sediment movement,
    - Seminars on nutrient management,
    - Management of watershed working groups,
    - Use of vegetated treatment systems to reduce sediment and pesticide movement, and
    - Grower survey to determine how their operations rank compared to the EPA sustainability index,
    - Facilitated the development of the Central Coast Non-Point Grazing Management Measures and a strategic management plan, which have served as a foundation for Cattlemen's efforts to address water quality.
- Tracked and provided formal comments on federal, state, and local regulations, policies and initiatives pertaining to Central Coast water quality.
- Participated in the Ag Water Quality Alliance (AWQA) that is composed of NRCS, six Resource Conservation Districts, University of California Cooperative Extension and the Monterey Bay National Marine Sanctuary to collaborate to improve water quality in the Monterey Bay area. The most important outcome was the award of a $5.2 million Ag Water Enhancement Program USDA grant to local NRCS offices.

- Made periodic presentations regarding water quality issues affecting Central Coast Agriculture to a wide variety of organizations such as the American Chemical Association, California Chapter of the Agronomy Society of America, Chemical Producers and Distributors Association, the Avocado Society, Ag Sustainability Expo and local CAPCA organizations.

Contract with Southern SLO and Santa Barbara Counties Agricultural Watershed Coalition, Watershed Coordinator

- Managed a Coalition of five trade associations formed through memorandum of understanding to assist growers with water quality management practices and regulatory compliance.
- Managed a five-year, $1,000,000 grant.
- Participated in 24 Farm and Rangeland Water Quality Planning Short Courses.
- Organized and/or provided fertility, sediment, pesticide and irrigation training at more 41 seminars, field days and conferences which were attended by more than 450 growers.
- Assisted 23 growers with writing Farm Water Quality Plans.
- Assisted more than 400 growers with compliance related questions regarding the Conditional Ag Waiver for Irrigated Lands.
- Wrote grant proposals for $1,509,281 and was awarded $490,545.20.
- Became intimately knowledgeable about Central Coast crop production practices, grower demographics, and grower business and political concerns.
- Co-organized the 2007 Co-Management of Water Quality and Food Safety Research Conference that was attended by key water quality and food safety professionals.
- Organized the Carpinteria Watershed Land to Sea Tour that reviewed agricultural and resource issues from a watershed perspective.
- Provided growers with information on management practices through seminars, workshops, field days and tours, and newsletters and web-site links.

Contract with Central Coast Water Quality Preservation, Inc., Interim Technical Program Manager

- Co-Facilitated the formation of Central Coast Water Quality Preservation, Inc. (CCWQP) to manage the Regional Water Quality Control Board mandated region-wide, agricultural Cooperative Monitoring Program (CMP).
- Facilitated grant writing and obtained 4 grants for a total of $3.25 million to offset grower compliance monitoring fees.

ICON **1995-1998**

- Owned and managed a special effects painting and furniture restoration business and antique store in Houston, Texas and California.

Employment 1980-2004

BASF, E.I. DuPont de Nemours/Shell Chemical, Shell Chemical, American Cyanamid

Business Representative

- Represented herbicide, pesticide and fungicide product lines in corn, cotton, alfalfa, table and wine grapes, strawberry, vegetable, tree fruit and nut, citrus and avocado markets in Southern and Coastal California.
- Coordinated with technical service representatives to augment technical services by reviewing test protocols, monitoring field trials, assessing field trial data, and out-sourcing contract research.
- Provided pest control advisors and growers with training on rates, timing, application techniques, precautions, and environmental information through presentations, seminars, field

days, and conferences.

- Conducted more than 80 product seminars with public agencies such as Caltrans to demonstrate proper use of vegetation management sulfonylurea herbicides.
- Organized more than 3 calibration seminars for large roadside spray application equipment.
- Negotiated contracts to obtain a streamlined and effective distribution system.
- Conducted a market survey of customers' buying decisions that demonstrated a shift in customer's needs from price awareness to environmental concerns.
- Provided impetus for "Product Re-emphasis Strategy" for sulfonylurea herbicides that involved all levels of management, toxicologists, residue specialists, and governmental agencies.
- Represented herbicide and insecticide product lines on corn, cotton, sorghum, potatoes and sugar beets in West Texas to more than 100 dealers, crop consultants and aerial applicators.

Geraghty and Miller (currently Arcadis U.S.)

Sales Representative

- Connected clients' needs from chemical, petroleum, natural gas industries and US Department of Defense with environmental services such as groundwater monitoring and remediation, data analysis, and compliance with RCRA, CERCLA and NPDES regulations and permits

Enseco, a subsidiary of Corning, Inc.

Sales Representative

- Provided environmental analytical services for conventional constituents, gas chromatography, mass spectrometry, and ICMS services.
- Wrote more than $8million in proposals to potential clients in the chemical, petroleum, and natural gas industries and US Air Force, US Navy, and the US Department of Energy.
- Liaised between the laboratory and clients to troubleshoot recurring laboratory errors.
- Participated in a critical three-month, Corrective Action Team to align marketing and laboratory processes with procurement activities.

Collingwood Grain

Crop Consultant

Provided field scouting and consulting services for fertilizer, pesticide and irrigation use in Southwest Kansas on 10,000 acres corn, 5,000 sorghum, 2,000 alfalfa, 1,000 acres wheat and soybeans.

EDUCATION/TRAINING:

- Golden Gate University School of Law San Francisco, CA.
- M.S. Agronomy (Specialty: Weed Science) (1985), Oklahoma State University.
- B.S. Agronomy (Specialty: Range Management) (1979), Oklahoma State University
- Have received additional training in leadership, presentation skills, sales and marketing, complaint handling, customer service, telemarketing, accounting, computer skills, and professional development.

LICENSE

- California licensed Pest Control Advisor (16 years)

PUBLICATIONS:

Mercer, K.L. The Challenges of Developing and Implementing Agronomic^{E} Practices. Chapter, American

Chemical Society Symposium Series: Pesticide Mitigation Strategies for Surface Water Quality. Eds. Dr. Kean Goh, Dr. Tom Potter, Dr. Brian Bret and Dr. Jay Gan. Pending. 2011.

Mercer, K.L., Pawlak, J.A., Murray, D.S., Verhalen, L.M., Riffle, M.S., and McNew R.W. Distance-of-influence of devil's-claw (*Proboscidea louisianica*) on cotton (*Gossypium hirsutum*). Weed Technol. 4:87-91. 1990.

Mercer, K.L., Murray D.S, and Verhalen, L.M. Interference of Unicorn-Plant (*Proboscidea louisianica)* with Cotton *(Gossypium hirsutum).* Weed Science. Vol.35: 807-812. 1987.

PRESENTATIONS at PROFESSIONAL MEETINGS:

Assessing the Economic Impact of New Water Quality Regulations, co-Presented with Brad Barbeau, Soil and Water Conservation Society 67th International Annual Conference, Fort Worth Texas, July 23, 2012. Powerpoint Presentation.

Central Coast Water Regulations and What Producers and PCAs Are Being Required To Do *And* "What Do They *Need* To Do? California Association of Pest Control Advisors, Reno, Nevada, October 18, 2011. Powerpoint Presentation.

Emerging Regulations for Nutrient Management Planning, Western Plant Health Association, Paso Robles, California, November 30, 2011. Powerpoint Presentation.

" Our Shared Legacy: Water and Land, Seminar Series in Partnership between Grower Shipper Association and Cal State University Monterey Bay. CSUMB, Seaside, California. October 22, 2010. PowerPoint Presentation.

"California – Thoughts on Agricultural Water Quality Regulations", California Bar Association, Ag Committee. Paso Robles, California. July 22, 1010. Oral presentation.

"Central Coast of California –Thoughts on Agricultural Water Quality Issues", Grower Shipper Association Foundation, AgKnowledge, Class IV. Marina, California. June 18, 2010. Power point Presentation.

"California – Thoughts on Water Quality and Water Quality Regulations". Chemical Producers and Distributors Association. Minneapolis, Minnesota. May 26, 2010. Power point Presentation. http://www.cpda.com/cpda/files/ccLibraryFiles/Filename/000000000402/California%20Water%20Quality.Kay%20Mercer.pdf

"Challenges of Creating a Change Continuum in the Agricultural Community: From Resistance to Adoption of Environmental Mitigations on the Central Coast of California". American Chemical Society, Symposium, Pesticide Mitigation Measures for Surface Water Quality Symposium. San Francisco, California. March 22, 2010. Power point Presentation.

"Water Quality Regulations". California Avocado Society. Ventura, California. October 17, 2009. Oral presentation.

"Management Practices and Water Quality: Conflict, Compromise, and Considerations". California Chapter, American Society of Agronomy. Fresno, California. February 4, 2009. Power point Presentation. http://ucanr.org/sites/calasa/files/319.pdf

Bianchi, M.L., Mercer, K.L., and Crohn, D.R. "Coordinated Management of Water Quality Management Practices and Food Safety Good Agricultural Practices". Soil and Water Conservation Society. *Tucson,*

Arizona, Jul 26, 2008. Power point Presentation.
<http://www.allacademic.com/meta/p235613_index.html

"Water Quality Regulation – TMDLs and Ag Waivers – Implications for On-Farm Water Quality Management". CSREES, Symposium, Coordinated Management of Water Quality Protection and Food Safety Practices in Cool Season Vegetable Production. Sparks, Nevada. February, 2008. Power point Presentation.

Mercer, K.L. and D.S. Murray. 1984. " Interference of devil's-claw with cotton. Proc. South. Weed Sci. Soc. 37:311

Mercer, K.L., Murray, D.S., and Verhalen, L.M. 1985. "Distance of influence of unicorn-plant (*Proboscidea louisianica*) on the production of cotton". Proc. South. Weed Sci. Soc. 38:361.

Dr. Lowell J. Zelinski

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PERSONAL INFORMATION

- Born 3/18/55 in Colorado Springs, CO.
- Married to Becky Zelinski
- Four children: Chad, Christy Ryan, and Ashley
- Raised in the San Fernando Valley north of Los Angeles, California

EDUCATION

High School

Graduated from St Genevieve's Catholic High School in 1973

- Received Senior Science Medal
- Eagle Scout for the Boy Scouts of America

Under Graduate Work

Attended the University of Southern California (USC) from 1973 to 1975

Major: Natural Science and Mathematics

Graduated from the University of California at Davis in 1978

Degree: Bachelors of Science
Major: Soil and Water Science
President of Soil and Water Students Association

Graduate Work

Graduated from Cal Polytechnic State University San Luis Obispo in 1981

Degree: Masters of Science
Major: General Agricultural Science with emphasis in Soil Science

Graduate Teaching Experience:

- Taught Introductory Soil Science 1979-80 at Cal Poly SLO.
- Taught Soil Management, Soil Genesis and Morphology, Soil Microbiology and Soil Mapping at California State Polytechnic University, Pomona in 1980-81.

Graduated from the University of California at Davis in 1995

Degree: Ph.D.
Major: Soil Science with a specialty in Plant - Soil - Water Relations
Ph. D. thesis topic: Interaction of Nitrogen and Water Stress on the Growth and Development of Cotton.

EXPERIENCE

Farm Advisor Trainee, University of California-1981

Selected as one of four from over 100 applicants

- First assignment: Soils, Corn and Small Grains in Yolo County

- Second assignment: Soils, Water and Cotton in Fresno County

Soils, Water and Cotton Farm Advisor for Fresno County-1982

Major accomplishments (in cooperation with others):

- Helped fdveloped computer-based cotton production expert system "CALEX"
- Developed nitrogen fertility guidelines for cotton in the San Joaquin Valley
- Developed water management guidelines for cotton in the San Joaquin Valley
- Helped created the California Irrigation Management Information System "CIMIS"
- Helped established Pix® usage guidelines
- Developed Cotton Cost of Production Worksheets
- Produced Valley-wide Farm Advisor Newsletter and year end report
- Helped developed the use of general cotton physiology knowledge to aid in crop management
- Assisted in statewide development of decision-making guidelines based on plant growth analysis (plant mapping) which has been widely adopted in the U.S. cotton industry and abroad

Private Consultant-1988

- Developed the first private cotton consulting business in the San Joaquin Valley to provide growers complete cotton production consulting as an integrated package.
- Consulted on more than 60,000 acres each year between 1989 and 1995
- Provided cotton production training for:
  Producers Cotton Oil Company
  Anderson-Clayton
  Britz Fertilizer Company
- Provided consulting services or contract research services to:
  Chevron, Eli Lily, BASF, American Cyanamid, Monsanto

Director of Agronomic Services, Delta and Pine Land Company-1995

- Developed a nationwide Agronomic Service Department for Deltapine Seed Division of Delta & Pine Land Company – the world's largest cottonseed company headquartered in Scott, Mississippi
- Led a D&PL Corporate effort in 1997 to develop the first computer-based cotton and soybean agronomic information system in the world

Vice President of Operations, California Planting Cotton Seed Distributors-1999

- Managed the production, processing, and quality control of all cottonseed produced by California Planting Cotton Seed Distributors (CPCSD)
- Supervised the expansion of the storage facility and modification of the delinting facilities to handle transgenic cottons
- CPCSD is the largest cottonseed company in the San Joaquin Valley
- Developed an inventory management system unique to cottonseed industry

Founder / President, Precision Ag Inc. – 2003

- Founded a consulting company to provide precision farming services to cotton and grape growers

- Developed system using remote sensing analysis to aid in soils analysis and crop production
- Developed and provide geographic information systems services to cotton growers
- Founded and own the Central Coast Cotton Conference – California's only cotton production meeting, which provides continuing education courses for pest control advisors, consultants, agronomists and growers. The conference is now in its sixth year and growing with strong industry support.
- Founded and own the Central Coast Vine Symposium – an educational conference for wine grape growers throughout California
- Provide production consulting to SJV farmers and Central Coast wine grape growers
- Provide consulting services and contract research services for corporations including Bayer CropScience, Gustafson, Arysta LifeScience
- Lectured for Calif. State Univ. Bakersfield Geology Dept.
- Provide cotton production training to pest control advisors for SJV chemical retail companies such as Western Farm Service, Wilbur Ellis Company, and Britz Fertilizers, Inc.
- Established a division of the company to provide statewide soil moisture monitoring sales and support, including weekly monitoring services

PROFESSIONAL ACCOMPLISHMENTS

- Soil Science Summer Field Course (Soils 105) at UC Davis - six week tour of the soils of California
- Attended all but one and presented papers at many Beltwide Cotton Production Conference since 1981
- Served as Chairman of the 2nd Soil Management Conference at the 1984 Beltwide
- Attended and presented papers at the First and Second World Cotton Conferences held in Brisbane Australia (1993) and Athens Greece (1998)
- Conducted more than 300 presentations on agronomic production topics
- Authored more than 100 publications
- Member of Class XXXIII California Ag Leadership Program, which included an international trip to India and Nepal

PROFESSIONAL AFFILIATIONS

- Crop Science Society of America
- American Society of Agronomy
- Paso Robles Chamber of Commerce
- Paso Robles Wine Country Alliance

COLLEGE COURSES TAUGHT

- Introductory Soil Science - Cal Polytechnic University, San Luis Obispo 1978 - 79
- Soil Management - Cal Polytechnic University, Pomona 1979 - 80
- Soil Genesis and Morphology - Cal Polytechnic University, Pomona 1979
- Soil Microbiology - Cal Polytechnic University, Pomona 1980
- Soil Mapping - Cal Polytechnic University, Pomona 1980
- Row Crops – California State University, Fresno 1985
- Water and the West – California State University, Bakersfield 2001, 2003, 2004

- Integrated Science – Extended University CSUB 2004

REFERENCES

Available upon request

SELECTED PUBLICATION AND PRESENTATION LIST

Available upon request

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Attorneys for Petitioners Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; and Western Growers

CALIFORNIA FARM BUREAU FEDERATION
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kfisher@cfbf.com

Attorneys for Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File Nos. A-2209(b), (d) DECLARATION OF STEPHEN L. CLARK IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

I, Stephen L. Clark, declare as follows:

1. I am an Environmental Scientist working in the field of Aquatic Ecotoxicology. I received my B.S. degree in Biology from California State University, Stanislaus in 1990. I have completed my Ph.D. qualification exam in Pharmacology and Toxicology (emphasis in Aquatic Toxicology) at the University of California, Davis, and am working on completing the writing of my dissertation. I was employed as a California Department of Fish and Game Fish and Wildlife Scientific Aid in aquatic toxicology laboratories from 1989-1990. I then worked in aquatic toxicology laboratories at the UC Santa Cruz Marine Pollution Laboratory from 1990-1993 and at UC Davis during my graduate studies in the Pharmacology and Toxicology graduate group from 1994-1999. In 1999, I was hired as the Laboratory Manager at Pacific EcoRisk, Inc. (currently headquartered in Fairfield, California), a firm specializing in the performance of aquatic toxicity testing, in addition to other related services; I have served as the Vice President and a Special Projects Director since 2006.

2. Through my academic and professional experience, I have served as a Project Manager for a significant number of large environmental monitoring programs. This experience has included over 15 years working with regulated parties and regulatory agency staff to develop monitoring designs and to establish laboratory quality control requirements. I have selected analytical laboratories to perform sample analysis and authored Quality Assurance Project Plans. I have also coordinated the development of sampling plans, coordinated sampling teams from multiple companies, assured that samples were distributed to analytical laboratories, and prepared reports of the related data.

3. I have served as the Monitoring Program Manager for the Cooperative Monitoring Program in the Central Coast of California since the program started in 2004/2005. I am familiar with the regulatory requirements of this program, including the costs for collecting and analyzing samples.

4. I reviewed the individual discharge monitoring requirements for tailwater, tile drain, and stormwater discharges provided in Table 5A in the Monitoring and Reporting Program Order No. R3-2012-0011-03 (Tier 3 MRP) for Tier 3 discharges, and identified laboratories that

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A Professional Corporation

are capable of meeting the quality control requirements of the Surface Water Ambient Monitoring Program (SWAMP), a requirement for all Tier 3 analyses. It is important to note that the SWAMP QC requirements include a field duplicate per batch of samples collected, which could effectively double the costs of sample analysis when a single ambient water sample is collected.

5. The individual discharge monitoring requirements in the Tier 3 MRP varies by the size of the farm/ranch. Farms/ranches ≤500 acres have a lower frequency of monitoring than those >500 acres. Assuming that a single ambient water sample is collected (along with the required field duplicate), the following sample analysis costs would be incurred annually for individual discharge monitoring during the irrigation season and wet season:

Table 1. Individual Discharge Monitoring Requirements and Costs for Farms/Ranches ≤500 acres

Parameter	Analytical Method	# of Events Required[a]	# Samples per Event[b]	Unit Cost per Sample	Net Cost
Discharge Flow	Field Measure	3	2	c	c
Approximate Duration of Flow	Calculation	3	2	c	c
Temperature	Field Measure	3	2	c	c
pH	Field Measure	3	2	c	c
Electrical Conductivity	Field Measure	3	2	c	c
Turbidity	EPA 180.1	3	2	$22.00	$132.00
Nitrate + Nitrite (as N)	EPA 353.2	3	2	$43.00	$258.00
Ammonia	SM4500	3	2	$43.00	$258.00
Chlorpyrifos Diazinon	EPA 614	2	2	$210.00	$840.00
Ceriodaphia dubia Toxicity (96-hr acute)	EPA-821-R-02-012	2	2	$400.00	$1600.00
Hyalella Toxicity in Water (10-day)	EPA-821-R-02-012	2	2	$550.00	$2200.00
				Sample Analysis Total	**$5288.00**

a – During irrigation season, two sampling events are required for basic water quality parameters and nutrients and one sampling event is required for the pesticide and toxicity analyses. An additional set of samples for all parameters are required once during the wet season.

b – includes a single ambient water sample and the required field duplicate (one per batch of samples).

c – cost would be covered via the rental rate of a multi-probe field meter (provided in sampling discussion below).

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Table 2. Individual Discharge Monitoring Requirements and Costs for Farms/Ranches > 500 acres					
Parameter	Analytical Method	# of Events Required[a]	# Samples per Event[b]	Unit Cost per Sample	Net Cost
Discharge Flow	Field Measure	6	2	c	c
Approximate Duration of Flow	Calculation	6	2	c	c
Temperature	Field Measure	6	2	c	c
pH	Field Measure	6	2	c	c
Electrical Conductivity	Field Measure	6	2	c	c
Turbidity	EPA 180.1	6	2	$22.00	$264.00
Nitrate + Nitrite (as N)	EPA 353.2	6	2	$43.00	$516.00
Ammonia	SM4500	6	2	$43.00	$516.00
Chlorpyrifos	EPA 614	4	2	$210.00	$1680.00
Diazinon					
Ceriodaphia dubia Toxicity (96-hr acute)	EPA-821-R-02-012	4	2	$400.00	$3200.00
Hyalella Toxicity in Water (10-day)	EPA-821-R-02-012	4	2	$550.00	$4400.00
				Sample Analysis Total	**$10,576.00**

a – During irrigation season, four sampling events are required for basic water quality parameters and nutrients and two sampling events are required for the pesticide and toxicity analyses. An additional set of samples for all parameters is required two sampling events during the wet season.

b – includes a single ambient water sample and the required field duplicate (one per batch of samples).

c – cost would be covered via the rental rate of a multi-probe field meter (provided in sampling discussion below).

6. In addition to the sample analysis costs above, sample collection costs would be incurred to collect the samples and ship them to the analytical laboratories. Sample collection by Pacific EcoRisk is billed out on a time and materials basis. As transit time to each farm/ranch would be different, the costs for each grower would be unique. However, the following estimates are provided for Pacific EcoRisk scientists to collect samples for a grower located in the Salinas area and the Santa Maria area.

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Table 3. Estimated Annual Sample Collection Costs for a Farms/Ranches ≤500 acres near Salinas, California

Task	Resource	# of Events Required	# Hours per Event	Unit Cost	Net Cost
Manage Monitoring	Project Manager	3	1	$165.00	$495.00
Mobilization	Field Scientist	3	1	$90.00	$270.00
Sampling	Senior Scientist	3	5.5	$108.00	$1782.00
	Field Scientist	3	5.5	$90.00	$1485.00
	Mileage	3	280	$0.55	$462.00
	Per diem (meals 2 @ $48/day)	3	N/A	$96.00	$288.00
	Bridge toll	3	N/A	$5.00	$15.00
	Multi-probe meter	3	N/A	$50.00	$150.00
	Supplies (e.g., ice)	3	N/A	$40.00	$120.00
Demobilization	Field Scientist	3	1	$90.00	$270.00
Equipment Decontamination	Technician	3	0.5	$52.00	$78.00
Preparation of Field Deliverable	Field Scientist	3	1	$108.00	$324.00
	Project Manager	3	0.5	$165.00	$247.50
				Sample Analysis Total	**$5986.50**

Table 4. Estimated Annual Sample Collection Costs for a Farms/Ranches >500 acres near Salinas, California

Task	Resource	# of Events Required	# Hours per Event	Unit Cost	Net Cost
Manage Monitoring	Project Manager	6	1	$165.00	$990.00
Mobilization	Field Scientist	6	1	$90.00	$540.00
Sampling	Senior Scientist	6	5.5	$108.00	$3564.00
	Field Scientist	6	5.5	$90.00	$2970.00
	Mileage	6	280	$0.55	$924.00
	Per diem (meals 2 @ $48/day)	6	N/A	$96.00	$576.00
	Bridge toll	6	N/A	$5.00	$30.00
	Multi-probe meter	6	N/A	$50.00	$300.00
	Supplies (e.g., ice)	6	N/A	$40.00	$240.00
Demobilization	Field Scientist	6	1	$90.00	$540.00
Equipment Decontamination	Technician	6	0.5	$52.00	$156.00
Preparation of Field Deliverable	Field Scientist	6	1	$108.00	$648.00
	Project Manager	6	0.5	$165.00	$495.00
				Sample Analysis Total	**$11,973.00**

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Table 5. Estimated Annual Sample Collection Costs for a Farms/Ranches ≤500 acres near Santa Maria, California

Task	Resource	# of Events Required	# Hours per Event	Unit Cost	Net Cost
Manage Monitoring	Project Manager	3	1	$165.00	$495.00
Mobilization	Field Scientist	3	1	$90.00	$270.00
Sampling	Senior Scientist	3	10	$108.00	$3240.00
	Field Scientist	3	10	$90.00	$2700.00
	Mileage	3	600	$0.55	$990.00
	Per diem (meals 2 @ $48/day)	3	N/A	$96.00	$288.00
	Bridge toll	3	N/A	$5.00	$15.00
	Multi-probe meter	3	N/A	$50.00	$150.00
	Supplies (e.g., ice)	3	N/A	$40.00	$120.00
Demobilization	Field Scientist	3	1	$90.00	$270.00
Equipment Decontamination	Technician	3	0.5	$52.00	$78.00
Preparation of Field Deliverable	Field Scientist	3	1	$108.00	$324.00
	Project Manager	3	0.5	$165.00	$247.50
				Sample Analysis Total	**$9187.50**

Table 6. Estimated Annual Sample Collection Costs for a Farms/Ranches >500 acres near Santa Maria, California

Task	Resource	# of Events Required	# Hours per Event	Unit Cost	Net Cost
Manage Monitoring	Project Manager	6	1	$165.00	$990.00
Mobilization	Field Scientist	6	1	$90.00	$540.00
Sampling	Senior Scientist	6	10	$108.00	$6480.00
	Field Scientist	6	10	$90.00	$5400.00
	Mileage	6	600	$0.55	$1980.00
	Per diem (meals 2 @ $48/day)	6	N/A	$96.00	$576.00
	Bridge toll	6	N/A	$5.00	$30.00
	Multi-probe meter	6	N/A	$50.00	$300.00
	Supplies (e.g., ice)	6	N/A	$40.00	$240.00
Demobilization	Field Scientist	6	1	$90.00	$540.00
Equipment Decontamination	Technician	6	0.5	$52.00	$156.00
Preparation of Field Deliverable	Field Scientist	6	1	$108.00	$648.00
	Project Manager	6	0.5	$165.00	$495.00
				Sample Analysis Total	**$18,375.00**

7. Based on the costs above, growers should expect the following total annual costs for sample collection and analysis of one ambient water sample per sampling event:

- $11,274 for a grower with a farm/ranch ≤500 acres in the Salinas area
- $22,549 for a grower with a farm/ranch >500 acres in the Salinas area
- $14,475.50 for a grower with a farm/ranch ≤500 acres in the Santa Maria area

- $28,951 for a grower with a farm/ranch >500 acres in the Santa Maria area

8. I reviewed the individual groundwater monitoring requirements provided in Table 3 in the Tier 3 MRP for Tier 3 discharges, and identified laboratories that are capable of meeting the quality control requirements of the SWAMP, a requirement for all Tier 3 analyses. It is important to note that the SWAMP QC requirements include a field duplicate per batch of samples collected, which could effectively double the costs of sample analysis when a single ambient water sample is collected.

9. The individual groundwater monitoring requirements in the Tier 3 MRP requires the initial collection of two rounds of samples per well – once during spring and once during fall. Assuming that a single well water sample is collected (along with the required field duplicate), the following sample analysis costs would be incurred annually for individual groundwater monitoring during the irrigation season and wet season:

Table 7. Individual Groundwater Monitoring Requirements and Costs

Parameter	Analytical Method	# of Events Required	# Samples per Event	Unit Cost per Sample	Net Cost
Groundwater depth	Field Measure	2	2	c	c
pH	Field Measure	2	2	c	c
Specific Conductance	Field Measure	2	2	c	c
Total Dissolved Solids	Field Measure	2	2	c	c
Total Alkalinity	EPA 310.1	2	2	$43.00	$172.00
Calcium[a]	EPA 200.8	2	2	$45.50	$182.00
Magnesium[a]	EPA 200.8	2	2	$45.50	$182.00
Sodium[a]	EPA 200.8	2	2	$45.50	$182.00
Potassium[a]	EPA 200.8	2	2	$45.50	$182.00
Sulfate	EPA 353.2	2	2	$41.00	$164.00
Chloride	EPA 353.2	2	2	$43.00	$172.00
Nitrate + Nitrite (as N)	EPA 353.2	2	2	$43.00	$172.00
				Sample Analysis Total	**$1080.00**

a – Includes sample digestion cost for turbid samples.

10. In addition to the sample analysis costs above, sample collection costs would be incurred to collect the samples and ship them to the analytical laboratories. Sample collection by Pacific EcoRisk is billed out on a time and materials basis. As transit time to each farm/ranch would be different, the costs for each grower would be unique. However, the following estimates

are provided for Pacific EcoRisk scientists to collect samples from a single well for a grower located in the Salinas area and the Santa Maria area.

Table 8. Estimated Annual Groundwater Sample Collection Costs for a Single Well Near Salinas, California

Task	Resource	# of Events Required	# Hours per Event	Unit Cost	Net Cost
Manage Monitoring	Project Manager	2	1	$165.00	$330.00
Mobilization	Field Scientist	2	0.5	$90.00	$90.00
Sampling	Senior Scientist	2	5	$108.00	$1080.00
	Field Scientist	2	5	$90.00	$900.00
	Mileage	2	280	$0.55	$308.00
	Per diem (meals 2 @ $48/day)	2	N/A	$96.00	$192.00
	Bridge toll	2	N/A	$5.00	$10.00
	Multi-probe meter	2	N/A	$50.00	$100.00
	Supplies (e.g., ice)	2	N/A	$20.00	$40.00
Demobilization	Field Scientist	2	0.5	$90.00	$90.00
Preparation of Field Deliverable	Field Scientist	2	1	$108.00	$216.00
	Project Manager	2	0.5	$165.00	$165.00
				Sample Analysis Total	**$3521.00**

Table 9. Estimated Annual Groundwater Sample Collection Costs for a Single Well Near Santa Maria, California

Task	Resource	# of Events Required	# Hours per Event	Unit Cost	Net Cost
Manage Monitoring	Project Manager	2	1	$165.00	$330.00
Mobilization	Field Scientist	2	0.5	$90.00	$180.00
Sampling	Senior Scientist	2	9.5	$108.00	$2052.00
	Field Scientist	2	9.5	$90.00	$1710.00
	Mileage	2	600	$0.55	$660.00
	Per diem (meals 2 @ $48/day)	2	N/A	$96.00	$192.00
	Bridge toll	2	N/A	$5.00	$10.00
	Multi-probe meter	2	N/A	$50.00	$100.00
	Supplies (e.g., ice)	2	N/A	$20.00	$40.00
Demobilization	Field Scientist	2	0.5	$90.00	$90.00
Preparation of Field Deliverable	Field Scientist	2	1	$108.00	$216.00
	Project Manager	2	0.5	$165.00	$165.00
				Sample Analysis Total	**$5745.00**

11. Based on the costs above, growers should expect the following total annual costs for sample collection and analysis of one well for the first year:

- $4601 for a grower with in the Salinas area
- $6825 for a grower in the Santa Maria area

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 24th day of August 2012, at Fairfield, California.

Stephen L. Clark

SOMACH SIMMONS & DUNN
A Professional Corporation

SOMACH SIMMONS & DUNN
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Attorneys for Petitioners Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; and Western Growers

CALIFORNIA FARM BUREAU FEDERATION
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Attorneys for Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File No. A-2209(b), (d) DECLARATION OF LAWRENCE GRICE IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

I, Lawrence Grice, declare as follows:

1. I am the Vice President/Project Manager of Grice Engineering in Salinas, CA, where I have worked since 1980. I am a Registered Civil Engineer. I have extensive experience in designing and managing the construction of containment structures for agricultural operations.

2. On March 15, 2012, the Central Coast Regional Water Quality Control Board (Central Coast Water Board) adopted Order No. R3-2012-0011 *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Conditional Waiver), Order No. R3-2012-0011-01 *Monitoring and Reporting Program for Tier 1 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 1 MRP), Order No. R3-2012-0011-02 *Monitoring and Reporting Program for Tier 2 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 2 MRP), and Order No. R3-2012-0011-03 *Monitoring and Reporting Program for Tier 3 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 3 MRP). (True and correct copies of these Orders were previously attached as Exhibits A, B, C, and D, respectively, to Grower-Shipper Association of Central California, Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties, and Western Growers' Petition for Review and Statement of Points and Authorities in Support Thereof (April 16, 2012).) I am familiar with the requirement contained in the Conditional Waiver with respect to containment structures.

3. The construction of tail water ponds is becoming necessary to meet increasing regulations of governmental agencies. In addition, these ponds are being scrutinized as potential sources of pollutants. Therefore the governmental agencies are indicating that construction and management of such structures needs to consider transport of pollutants to aquifers.

4. Construction of a typical tail water pond is detailed on the attached set of plan. (Attached hereto as Exhibit 1.) The pond identified in Exhibit 1 is essentially designed to manage 110 acres of agricultural land utilized for the propagation of vegetables in row crop.

5. To estimate costs for construction of such a pond, I contacted several contractors that routinely complete such structures. In addition to construction costs, I have also requested

SOMACH SIMMONS & DUNN
A Professional Corporation

and obtained costs with respect to lining the pond utilizing a variety of methods.

6. Based on the verbal estimates I obtained, the cost of general grading ranges from $10 to $35 dollar per yard of earth. This includes on site disposal of excess materials. Where there are no on site locations are available for disposal of excess materials, additional fees will be incurred for disposal, which may range up to $40 per yard.

7. Provision and installation of the indicated transfer pipes is between $120 and $140 per foot of pipe. The provision and installation of the indicated draft tube and discharge pump is approximately $6,000. The price of installation for such is dependent on the availability of power or use of an engine driven pump.

8. The installation of an HDPE liners ranges from $0.70 to $1.07 per square foot. Installation of a bentonite liner is approximately $4.60 per square foot, but may have a wide range depending on availability and type of material treated. As an alternative to either of these liners, the surfical 2 feet of the pond may be compacted to greater than 95% Relative Compaction at an estimated cost of $1.50 and/or a native clay liner may be constructed at a cost of $3.00 per square foot.

9. Depending on the location of the construction, certain professional services and governmental fees may be involved. It is estimated that a Grading Permit will be required in most areas and will cost $3,500. Generally, this requires a Grading Plan, which will cost an additional $3,500, and a Topographical Survey adding approximately $2,500. To ensure construction within the prescribed boundaries and to the indicated form, construction stacking would be necessary at an expense of $1,500.

10. In conclusion, to construct a typical pond like the one outlined in Exhibit 1, a grower is likely to incur the following expenses: (1) General Grading = $53,707.00; (2) Transfer Pipes = $8,000.00; (3) Discharge Pump = $6,000.00; (4) Liner (a) HDPE = $20,925.00, (b) Bentonite = $99,580.00; (c) Compaction = $32,472.00; (d) Native Clay = $64,944.00; (5) Permit = $3,500.00; (6) Engineering = $3,500.00; (7) Survey = $2,500.00; and, (8) Staking = $1,500.00.

11. Therefore, the estimated maximum cost of the indicated tail water ponds would be approximately $178,287.00 and the minimum would be $99,632.00.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 26 day of August 2012, at Salinas, California.

Lawrence Grice

RECOMMENDED GRADING SPECIFICATIONS FOR EARTHWORK

ET:1 General Description:

1.1 This item shall consist of all clearing and grubbing; preparation of land to be filled; excavation and fill of the land; spreading, compaction and control of the fill; and all subsidiary work necessary to complete the graded area to conform with the lines, grades and slopes as shown on the approved plans.

1.2 The Contractor shall provide all equipment and labor necessary to complete the work as specified herein, as shown on the approved plans as stated in the project specifications.

1.3 Retaining walls require a separate building permit.

ET:2 Tests:

2.1 The standard test used to define maximum densities of all compaction work shall be the A.S.T.M. D-1557, Moisture Density of Soils, using a 10-pound ram and 18-inch drop. All densities shall be expressed as a relative density in terms of the maximum density obtained in the laboratory by the foregoing standard procedure.

2.2 In-place density shall be determined by Test Methods A.S.T.M. D-1556, Density of Soil In-Place by Sand Cone Method and D-2922, Density of Soil In-Place by Nuclear Method.

2.3 Pad elevations shall be certified to 0.1 feet, prior to digging any footings or scheduling any inspections.

ET:3 Clearing, Grubbing and Preparing Areas To Be Excavated Or Filled:

3.1 All vegetable matter, irreducible material greater than 4 inches and other deleterious materials shall be removed from the areas in which grading is to be done. Such materials not suitable for reuse shall be disposed of as directed.

3.2 After the foundation for fill has been cleared, it shall be brought to the proper moisture content by adding water or aerating and compacting to a relative density of not less than 90% or as specified. The soils shall be tested to a depth sufficient to determine quality and shall be approved by the Soils Engineer for foundation purposes prior to placing engineered fill.

ET:4 Materials:

4.1 The material for engineered fill shall be approved by the Soils Engineer before commencement of grading operations. Any imported material must be approved for use before being brought to the site. The material used shall be free from vegetable matter and other deleterious materials.

4.2 Imported materials for engineered fill shall consist of non-expansive soil with maximum aggregate size of 4 inches, a PI less than 15 and/or a Cu greater than 4 and shall be approved by the Engineer.

ET:5 Placing, Spreading and Compacting Fill Material:

5.1 The selected fill material shall be placed in layers which, when compacted, shall not exceed 6 inches in thickness. Each layer shall be spread evenly and shall be thoroughly mixed during the spreading to ensure uniformity of material in each layer. Fill shall be placed such that cross fall does not exceed 1 foot in 20 unless otherwise directed.

5.2 When fill material includes rock or concrete rubble, no irreducible material larger than 4 inches in greatest dimension will be allowed except under the direction of the Soils Engineer.

5.3 The moisture content of the fill material shall be maintained in a suitable range to permit efficient compaction. The Soils Engineer may require adding moisture, aerating, or blending of wet and dry soils.

5.4 Each layer shall be compacted to a relative density of not less than 90% relative density or as specified in the soils report and on the accepted plans. Compaction shall be continuous over the entire area of each layer.

5.5 Field density test shall be made by the Soils Engineer of each compacted layer. At least one test shall be made for each 500 cubic yards or fraction thereof, placed with a minimum of two tests per layer in isolated areas. Where a sheep-foot roller is used, the soil may be disturbed to a depth of several inches. Density tests shall be taken in compacted materials below the disturbed surface. When these tests indicate that the density of any layer of fill or portion thereof, is below the required density, that particular layer or portion shall be reworked until the required density has been obtained.

5.6 All earth moving and work operations shall be controlled to prevent water from running into excavated areas. All such water shall be promptly removed and the site kept dry.

5.7 Cut steeper than one horizontal to one vertical and fill slopes steeper than two horizontal to one vertical must be approved by the soils engineer.

ET:6 Seasonal Limits:

6.1 When the work is interrupted by rain, fill operations shall not be resumed until field tests by the Soils Engineer indicate that the moisture content and density of the fill is as previously specified and soils to be placed are in suitable condition.

ET:7 Unusual Conditions:

7.1 In the event that any unusual conditions are encountered during grading operations which are not covered by the soil investigation or the specifications, the Soils Engineer shall be immediately notified such that additional recommendations may be made.

ET:8 County

8.1 A copy of all compaction tests and final grading reports shall be submitted to the County prior to scheduling any inspections.

8.2 All grading shall conform with the Monterey County Grading Ordinance #2535 except as noted on these plans.

8.3 Permits expire 180 days from issuance or last inspection date, whichever is most recent.

EROSION CONTROL

ER:1 General Description:

1.1 This project is to control irrigation generated runoff with on site detention and dispersment of clarified water. Non-irrigation natural (storm) runoff is to be released to the natural drainage ways down slope of the project area. Such flows should be conveyed in pipes or lined ditches and released across energy dissipater(s) to reduce the hydraulic gradient before entering existing drainage structures.

1.2 Any site soils or other materials which are disturbed shall be adequately watered to prevent dust from becoming airborne in accordance with local dust control ordinances.

ER:2 Materials Storage:

2.1 During construction, never store cut and fill material where it may wash into streams or drainage ways. Should weather threaten the stored materials it should be covered with plastic or appropriate retention facilities provided for de-siltation of the storm water prior to release.

2.2 Keep all culverts and drainage facilities free of silt and debris. Keep emergency erosion control materials such as straw mulch, plastic sheeting, and sandbags on site and install these at the end of each day as necessary during periods of probably rainfall.

ER:3 Re-vegetation and Planting:

3.1 The adjacent areas are utilized for agricultural purposes. As weeds and pests associated with such vegetation are considered potentially hazardous for food crops no specific re-vegetation is proposed.

3.2 In the absence of a detailed Erosion Control Plan, the work will be protected in accordance with the appropriate ordinance, regulation and/or standard practice which ever provides satisfactory erosion protection.

ER:4 County

4.1 All erosion control measures for grading shall be in place at the end of each working day between October 15 and April 15.

4.2 All erosion control measures shall conform with Monterey County Erosion Control Ordinance #2806 provided they are in agreement with the current agricultural practices and don't present a hazardous condition to food crop production.

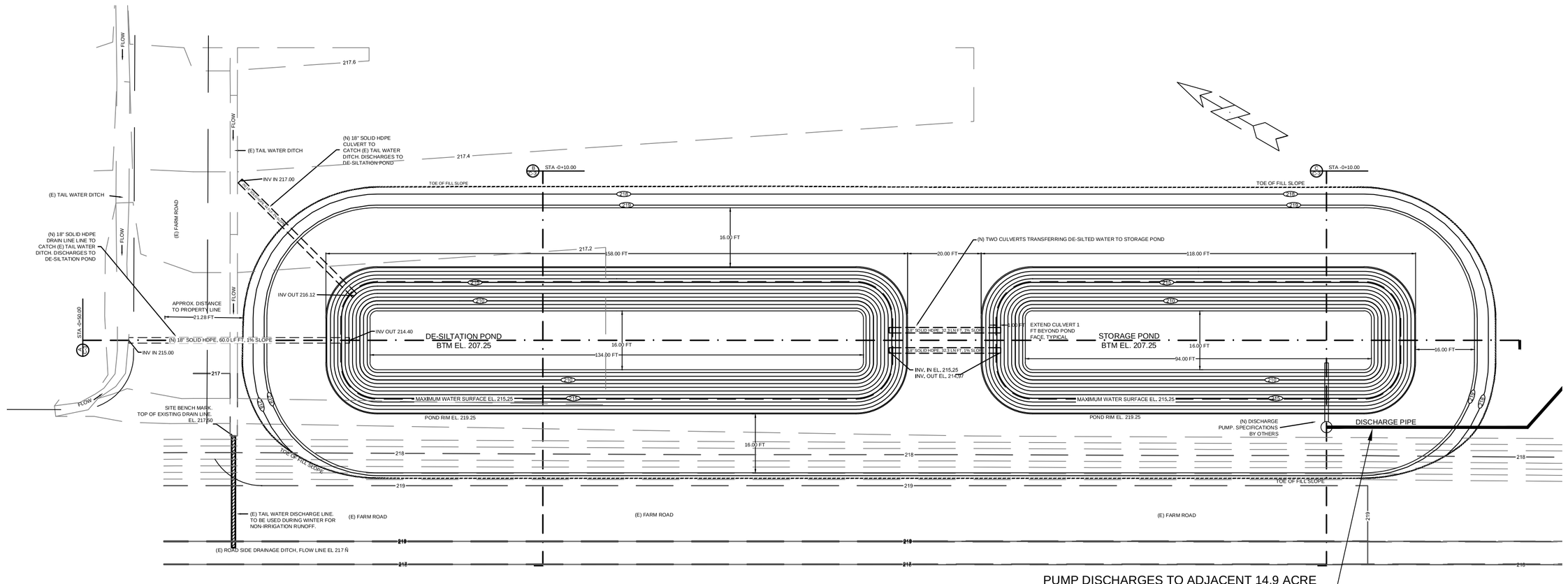
THESE PLANS ARE FOR THE CONSTRUCTION OF A DE-SILTATION POND AND A STORAGE POND FOR THE COLLECTION OF AGRICULTURAL IRRIGATION RUNOFF. COLLECTED RUNOFF WILL BE DETAINED AND DISPERSED ON-SITE TO A NON FOOD CROP FIELD.

APPROXIMATE AREA OF SOIL DISTURBANCE : 25,904 SQ. FT.
GRADING VOLUMES
TOTAL CUT = 2387 CUBIC YARDS
TOTAL FILL = 938 CUBIC YARDS
EXCESS CUT = 1449 CUBIC YARDS
EXCESS CUT TO BE SPREAD ON ADJACENT FIELDS DURING LEVELING
TOTAL EXPORT = 0.0 CUBIC YARDS
TOTAL IMPORT = 0.0 CUBIC YARDS
NO SHRINKAGE FACTORS USED

INDEX

PROJECT OWNER:
TYPICAL FARM IN CALIFORNIA.

PROJECT CIVIL AND GEOTECHNICAL ENGINEER:
GRICE ENGINEERING, INC.
561A BRUNKEN AVENUE
SALINAS, CALIFORNIA 93901
(831) 422-9619



PUMP DISCHARGES TO ADJACENT 14.9 ACRE FIELD FOR DISPERSAL. FIELD IS USED FOR NON FOOD CROP PRODUCTION.

SITE PLAN
SCALE 1" = 20'

REVISION DATES

GRICE ENGINEERING INC
ENGINEERING • GEOTECHNICS • HYDROLOGY • SOILS • FOUNDATIONS • EARTH STRUCTURES
561A Brunken Avenue Salinas, California Salinas: (831) 422-9619 Monterey: (831) 375-1198 FAX: (831) 422-1896

NOT VALID WITHOUT STAMP AND SIGNATURE

LAWRENCE E. GRICE, P.E. ; R.C.E. 66857

PREPARED FOR:

TYPICAL FARM IN CALIFORNIA

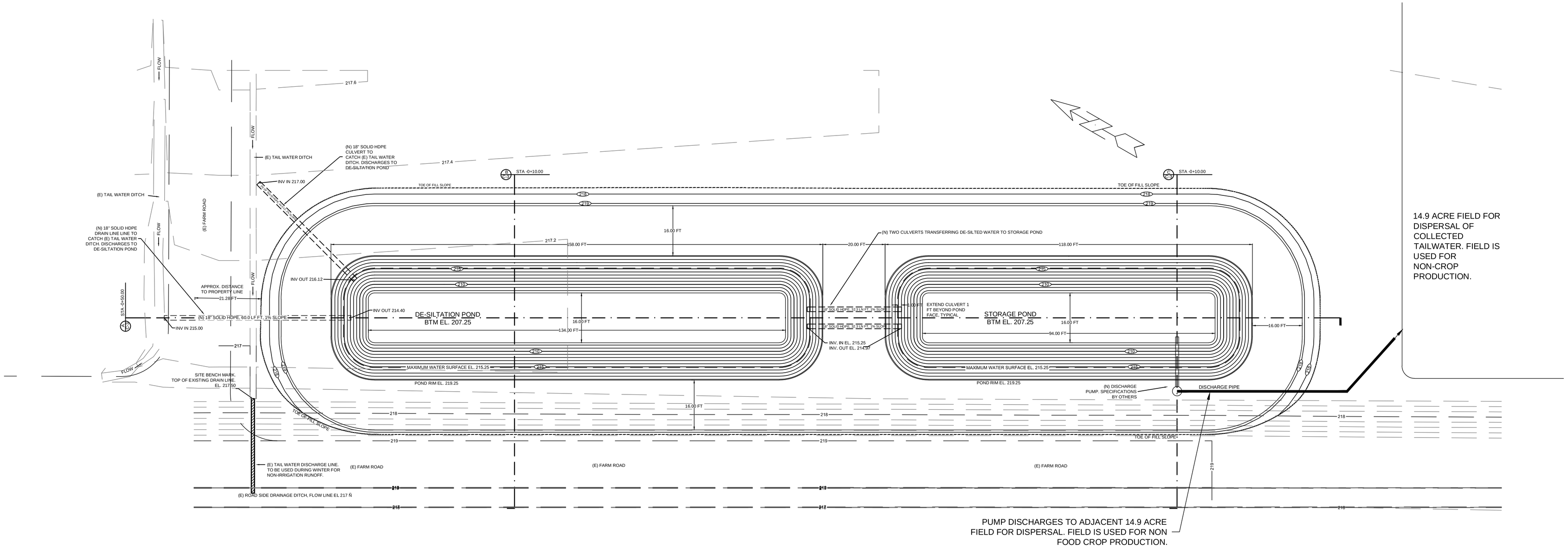
AGRICULTURAL IRRIGATION TAIL WATER COLLECTION
TYPICAL AGRICULTURAL FARM

IMPROVEMENT PLANS
TITLE, NOTES AND SPECIFICATIONS

T-1
Date Plotted: Aug 20, 2012

CALIFORNIA FARM
FILE NO. 5994-12.08

EXHIBIT 1



14.9 ACRE FIELD FOR DISPERSAL OF COLLECTED TAILWATER. FIELD IS USED FOR NON-CROP PRODUCTION.

LEGEND

EXISTING CONTOUR, MAJOR, 1 FT INTERVAL
EXISTING CONTOUR, MINOR, 0.2 FT INTERVAL
NEW CONTOUR, MAJOR, 5 FT INTERVAL
NEW CONTOUR, MINOR, 1 FT INTERVAL
MAXIMUM WATER ELEVATION
TOE OF FILL
CULVERT
EDGE OF ROAD

ABBREVIATIONS

BTM	BOTTOM
(E)	EXISTING
EL	ELEVATION IN FEET
FT	FOOT OR FEET
H	HORIZONTAL
HDPE	HIGH DENSITY POLYETHYLENE
IN	INCH OR INCHES
INV	INVERT
LF	LINEAR FEET
(N)	NEW
V	VERTICAL

BEGINNING OF SECTION
REFERENCE TO SECTION AND SHEET
SECTION LINE
END OF SECTION
STATION OF POINT ON SURFACE, FEET OF PLAN LENGTH
ELEVATION AT POINT ON SURFACE, FEET OF ELEVATION
0+16.00
219.25

SITE PLAN - SITE GRADING AND DRAINAGE

SCALE 1" = 16'

DE-SILTATION POND
TOTAL DEPTH = 12 FT
FREEBOARD = 2 FT
EFFECTIVE DEPTH @ WATERLINE = 8 FT
VOLUME @ WATER LINE = 27,416 CUBIC FEET = 0.629 ACRE-FEET

STORAGE POND
TOTAL DEPTH = 12 FT
FREEBOARD = 2 FT
EFFECTIVE DEPTH AT WATERLINE = 8 FT
VOLUME @ WATER LINE = 19,736 CUBIC FEET = 0.453 ACRE-FEET

GRICE ENGINEERING INC
ENGINEERING • GEOTECHNICS • HYDROLOGY • SOILS • FOUNDATIONS • EARTH STRUCTURES
561A Brunken Avenue Salinas, California Salinas: (831) 422-9619 Monterey: (831) 375-1198 FAX: (831) 422-1896

NOT VALID WITHOUT STAMP AND SIGNATURE

LAWRENCE E. GRICE, P.E. ; R.C.E. 66857

PREPARED FOR:

TYPICAL FARM IN CALIFORNIA

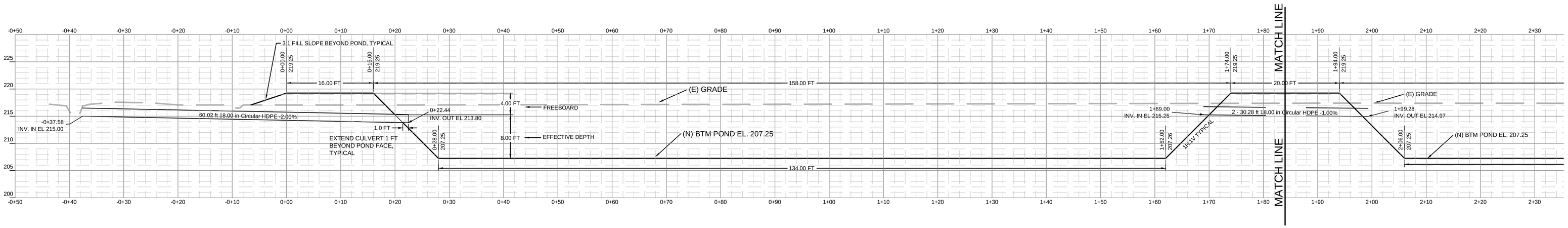
AGRICULTURAL IRRIGATION TAIL WATER COLLECTION
TYPICAL AGRICULTURAL FARM

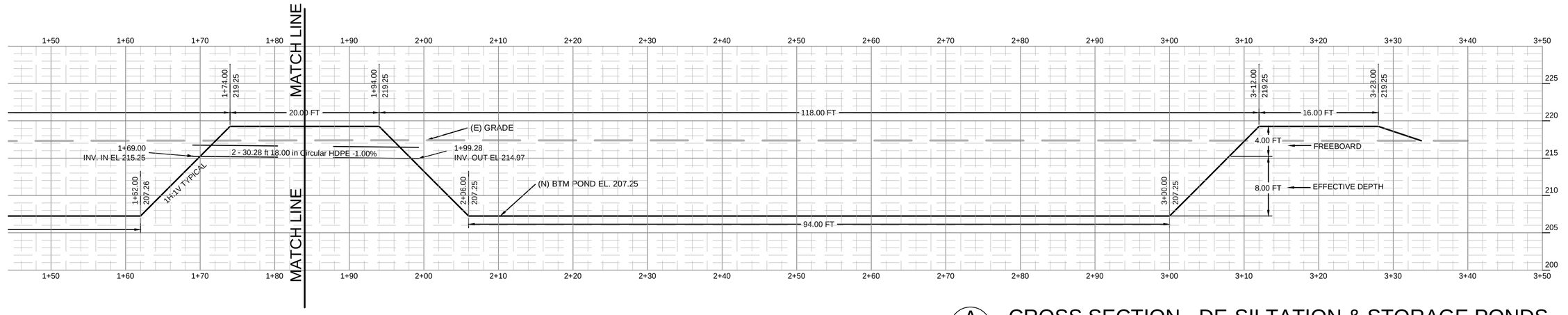
IMPROVEMENT PLANS
SITE PLAN

C-1
Date Plotted: Aug 20, 2012

CALIFORNIA FARM
FILE NO. 5994-12.08

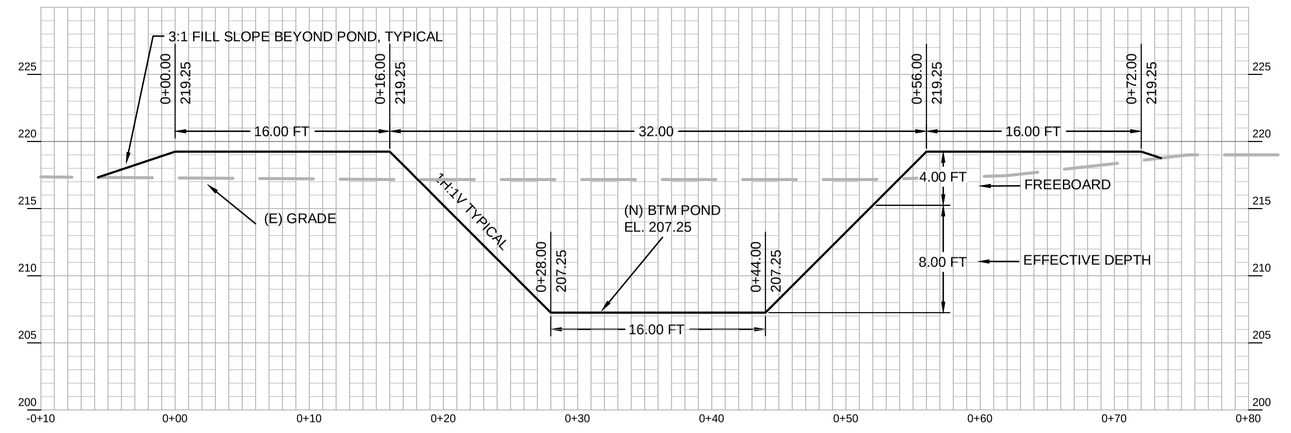
EXHIBIT 1





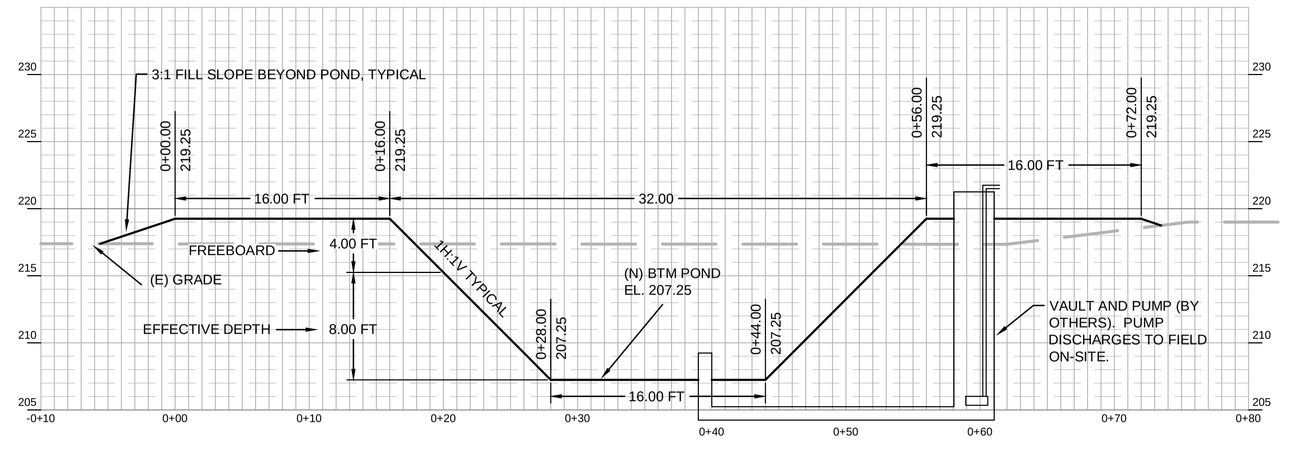
A CROSS SECTION - DE-SILTATION & STORAGE PONDS

SCALE 1" = 10'



B CROSS SECTION - DE-SILTATION POND

SCALE 1" = 8'



C CROSS SECTION - STORAGE POND

SCALE 1" = 8'

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LAWRENCE E. GRICE, P.E. ; R.C.E. 66857

PREPARED FOR:

TYPICAL FARM IN
CALIFORNIA

AGRICULTURAL IRRIGATION TAIL WATER COLLECTION
TYPICAL AGRICULTURAL FARM

IMPROVEMENT PLANS
CROSS SECTIONS

C-2
Date Plotted: Aug 20, 2012

CALIFORNIA FARM
FILE NO. 5994-12.08

EXHIBIT 1

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Attorneys for Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau

BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File Nos. A-2209(b), (d) DECLARATION OF MICHAEL L. JOHNSON IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

I, Michael L. Johnson, declare as follows:

1. I am President and Managing Partner of MLJ-LLC, a water quality consulting firm that offers expertise in ecology and toxicology, knowledge of quality assurance, understanding and management of laboratory performance, research based on peer reviewed science, and expertise in sampling various media in a range of environments.

2. I have a Ph.D. in Ecology from the University of Kansas and a B.A. and M.A. in Biology from the University of Colorado. I have spent the last 20 years performing monitoring and research on water quality issues in California. From 1992-2010, I worked at the University of California, Davis, beginning as a Research Scientist in the Department of Civil and Environmental Engineering. I joined the Center for Watershed Sciences in the John Muir Institute of the Environment in 1998 and later joined the Department of Medicine and Epidemiology in the School of Veterinary Medicine as an Adjunct Professor. Since 2005, I have provided consulting services to a variety of clients including agricultural coalitions, urban stewardship organizations, various agencies and public utilities. I have expertise in developing and preparing surface water sampling and analysis plans, and Quality Assurance Project Plans (QAPPs).

3. Through MLJ-LLC, I have served as technical program manager and technical lead for two agricultural coalitions in the San Joaquin Valley – the East San Joaquin Water Quality Coalition and the San Joaquin County and Delta Water Quality Coalition. Both coalition programs involve monitoring for toxicity, pesticides, nutrients, and salts. I regularly meet with Central Valley Regional Water Quality Control Board staff regarding coalition monitoring and data interpretation, and I am involved in technical and policy discussions on behalf of the coalitions with irrigation districts, the dairy industry, and agricultural industry suppliers.

4. On March 15, 2012, the Central Coast Regional Water Quality Control Board (Central Coast Water Board) adopted Order No. R3-2012-0011 *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Conditional Waiver), Order No. R3-2012-0011-01 *Monitoring and Reporting Program for Tier 1 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated*

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Lands (Tier 1 MRP), Order No. R3-2012-0011-02 *Monitoring and Reporting Program for Tier 2 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 2 MRP), and Order No. R3-2012-0011-03 *Monitoring and Reporting Program for Tier 3 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 3 MRP). (True and correct copies of these Orders were previously attached as Exhibits A, B, C, and D, respectively, to Grower-Shipper Association of Central California, Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties, and Western Growers' Petition for Review and Statement of Points and Authorities in Support Thereof (April 16, 2012).) I am familiar with the requirements contained in the Conditional Waiver, Tier 1 MRP, Tier 2 MRP, and Tier 3 MRP.

5. On April 16, 2012, a declaration prepared by me was submitted to the State Water Resources Control Board (State Water Board) in support of the Grower-Shipper Association of Central California, Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties, and Western Growers Request for Stay (April 2012 Declaration).

6. In my April 2012 Declaration, I estimated that the cost to prepare an individual Sampling and Analysis Plan (SAP) and a QAPP for a Tier 3 farm/ranch that complies with the Tier 3 MRP, would be approximately $28,800 regardless of the size of the farm/ranch. For each additional parcel, the cost was estimated to be 5% more for costs associated with mapping and researching additional waterbodies. The assumptions with respect to this cost estimate are provided below in paragraphs 7 through 14.

7. The cost estimates provided are based on experience gained during the development and implementation of seven monitoring programs across the Central Valley and San Francisco Bay regions from 2000 through 2012. Associated with those monitoring programs was the preparation of 12 QAPPs and the updating of those plans 16 times over 12 years. Of these, nine QAPPs were prepared by MLJ-LLC and three by Dr. Michael Johnson on contracts received through UC Davis. Fifteen updates were performed by MLJ-LLC and one by Dr. Johnson through UC Davis.

8. A complete QAPP is prepared according to the [United States] EPA Requirements for Quality Assurance Project Plans (2001, QA/R-5, http://waterboards.ca.gov/water_issues/programs/swamp/tools.shtml#qa) as specified in the Tier 3 MRP. The QAPP would also conform to the American National Standard for quality assurance systems (ANSI/ASQC E4-1994), and USEPA's Guidance for Quality Assurance Project Plans (2002).

9. The QAPP is completed using the QAPP template provided by the USEPA at www.epa.gov/osem/stategrants/PDFs/QAPP_Template_ERP.doc.

10. The number of hours necessary to prepare the QAPP and SAP is 192.

11. The number of hours needed to complete the QAPP and SAP is considered average for a monitoring program with the number of constituents identified in Tables 5A and 5B of the Tier 3 MRP.

12. All work can be done at the consultant's office and no site visit is necessary.

13. The labor cost per hour is $150.

14. The cost for each element is as follows:

Element	Hour Estimate	Total Cost
QAPP		
Develop four elements specified in MRP	**40**	**$6,000**
SOP incorporation and lab communication	**64**	**$9,600**
SRWQ-SAMP		
Sampling and Analysis Plan	**64**	**$9,600**
GIS Mapping	**24**	**$3,600**
Total Cost		**$28,800**

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 24th day of August 2012, at Davis, California.

Michael L. Johnson

Michael L. Johnson

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BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File Nos. A-2209(b), (d) DECLARATION OF KAY MERCER IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

I, Kay Mercer, declare as follows:

1. I am the owner of KMI, a consulting firm that delivers services to assist and advise the agricultural community with management and production improvements to protect water and natural resources within the geographic boundaries of the Central Coast Regional Water Quality Control Board (Central Coast Water Board). In that capacity, I work with individual growers, landowners, trade associations, and corporations to identify water quality issues and relevant regulations, and try to address both.

2. I have a B.S in Agronomy with a specialty in Range Management, and a M.S. in Agronomy with a specialty in Weed Science. I received a robust education in crop production, botany, ecology and animal production. I have been involved with production agriculture for 22 years; eight (8) years of that time I spent working on agricultural water quality issues. Additionally, I have worked for an environmental laboratory and an environmental groundwater remediation firm for 3 years. In addition to technical expertise, I have strong working knowledge of California cropping patterns, pesticide use patterns and applications, grower and consultant training requirements, private industry decision-making processes, and industry interconnections throughout the Central Coast. I also have experience in working with growers to assist them in estimating potential costs with respect to implementing provisions in the Conditional Waiver.

3. On March 15, 2012, the Central Coast Water Board adopted Order No. R3-2012-0011 *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Conditional Waiver), Order No. R3-2012-0011-01 *Monitoring and Reporting Program for Tier 1 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 1 MRP), Order No. R3-2012-0011-02 *Monitoring and Reporting Program for Tier 2 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 2 MRP), and Order No. R3-2012-0011-03 *Monitoring and Reporting Program for Tier 3 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 3 MRP). (True and correct copies of these Orders were previously attached as Exhibits A, B, C, and D, respectively, to Grower-Shipper Association of Central California, Grower-Shipper

Association of Santa Barbara and San Luis Obispo Counties, and Western Growers' Petition for Review and Statement of Points and Authorities in Support Thereof (April 16, 2012).) I am familiar with the requirements contained in the Conditional Waiver, Tier 1 MRP, Tier 2 MRP, and Tier 3 MRP.

4. On August 2, 2012, the State Water Resources Control Board (State Water Board) issued a Notice of Public Hearing on Stay Requests. In the Notice of Public Hearing on Stay Requests, the State Water Board has asked that parties provide cost estimates, and the underlying assumptions for those cost estimates, for specific actions identified by the State Water Board. The actions identified by the State Water Board include the following: installation of back flow prevention devices; maintenance of containment structures; maintenance of riparian vegetative cover and of riparian areas; practice effectiveness and compliance reporting; groundwater monitoring; annual compliance form reporting; determination of nitrate loading risk factors determination of total nitrogen applied; photo monitoring; and, individual surface water discharge monitoring and reporting.

5. In paragraphs 6 through 28, I have identified difficulties associated with estimating costs for some of the requirements specified in the State Water Board's hearing notice, and have provided other estimated costs based on my conversations with various vendors.

6. Installation of back flow prevention devices: I have reviewed county ordinances in Monterey and San Luis Obispo Counties and find it difficult to determine precise requirements for back flow prevention related to fertigation. County ordinances default to state regulations. However, no state regulation exists for fertigation. I have consulted existing guidelines as well as the California Department of Pesticide Regulation chemigation regulations and find it difficult to advise my clients with respect to precisely what they are required to install in order to be compliant with the Conditional Waiver. This uncertainty makes it difficult to ascertain costs associated with the Conditional Waiver.

7. Maintenance of containment structures: I discussed several compliance options such as de minimus irrigation water run-off, fertilizer reductions and nitrate treatment with my clients relative to this provision. One of my clients concluded that while the first two options are

his ultimate goal, the only way he could comply with this provision [to prevent percolation], in the short term, is to line his ponds. This client has 20 containment structures. The estimated square footage of these ponds is 370,786 square feet. This was calculated using the area of the pond to the high water mark with a Google Map measuring tool. This is a conservative estimate as it does not take the depth and slope of the containment structures into account. Using this square footage and cost estimates provided by Lawrence Grice in his declaration, the possible range of costs to line this client's containment structures is $259,550.20 to $1,705,615.60.

8. Annual compliance form reporting: The Central Coast Water Board has not yet provided the electronic format for Annual Compliance Form reporting and this makes it difficult to estimate grower costs. Growers, particularly Tier 3 growers, will need to modify previous data collection and reporting systems and processes in order to capture data to comply with October 1, 2012 and October 1, 2013 Annual Compliance Form reporting requirements. Challenges and costs associated with data management systems necessary to facilitate this provision are discussed below.

9. Determination of nitrate loading risk factors, determination of total nitrogen applied: Growers, particularly Tier 3 growers, will need to modify previous data collection and reporting systems and processes in order to capture data to comply with October 1, 2012 and October 1, 2013 Nitrate Loading Risk factor calculations and determination of total nitrogen applied. Challenges and costs associated with data management systems necessary to facilitate this provision are discussed below.

10. Data management will be essential for both Tier 2 and Tier 3 growers who have calculated a High Nitrate Loading Risk. Growers must start collecting, collating and processing information *now* in order to meet 2012 and 2013 reporting requirements as well as future reporting requirements such as Nitrogen Crop Uptake Values, Irrigation Nutrient Management Plan (INMP), and Nitrogen Balance Ratios. Decisions that growers make today about how they collect data will have long-term impacts on their capabilities to provide accurate and meaningful information throughout the term of the Conditional Waiver. Based on my discussions with growers, it is my professional opinion that certain database-related issues need to be decided

within the next two weeks in order for Tier 2 and Tier 3 growers to calculate the Nitrate Loading Risk, and to determine nitrogen use on a per acre per farm/ranch basis by October 1, 2012. Further, Tier 3 growers need to make major decisions about how to incorporate data from individual farm/ranch surface water monitoring into their database for problem solving purposes. It is assumed that data reporting and incorporation will be a component of their Quality Assurance Project Plans (QAPPs). Therefore, decisions regarding data collection and processing must be made in the first quarter of 2013 in order to write a complete QAPP. Costs will be associated with these decisions. Options and potential costs are discussed below.

11. Lack of specificity with respect to the reporting time period makes it difficult to properly collect data. By October 1 of every year, growers are required to make specified reports. However, the October 1 reporting deadline bifurcates the vegetable crop year. Growers are unsure whether they are required to report on a calendar basis, or for the previous full crop year, or the partial crop year for the year being reported. Without specificity, there is a probability that "rework" will result and increase grower costs for data collection and reporting.

12. It is important that there is specificity about what information growers are required to report in order to be able to design a database that collects, collates and processes the information efficiently and accurately. Ongoing clarifications or revisions to reporting requirements can mean expensive rework of data collection systems and information. For example, currently, there is uncertainty with respect to how total annual applied nitrogen should be reported. Should it be reported as: (1) nitrogen applied per acre/year/farm, (2) nitrogen applied per crop type (i.e., commodity)/acre/year/farm, or (3) nitrogen applied per crop (i.e., first or second crop)/acre/year/farm? In the Conditional Waiver, Finding 70, Tier 2, and Tier 3 growers with a High Nitrate Loading Risk are required to record and report *total nitrogen applied* in the Annual Compliance Form. In the Tier 2 MRP, Part 2.C.5, growers with a High Nitrate Loading Risk must report *total nitrogen applied per crop per acre per year*. But, in the Tier 3 MRP, Part 3.A.1, Tier 3 dischargers with farms/ranches that have a High Nitrate Loading Risk are directed to *report the total nitrogen applied per acre to each farm/ranch or nitrate loading risk*. With respect to the use of the term "crop", it is unclear whether this is a reference for crop type

(i.e., commodity such as lettuce, broccoli) or crop timing (i.e., first or second crop). It is important that reporting units be clearly specified in order to design the proper data collection system.

13. Many farming operations grow in various geographies. Growing areas are composed of farm/ranches. Those farm/ranches are broken into blocks that are further divided into individual plantings. It is customary for vegetable production cost accounting to be on a per-planting basis rather than a farm/ranch or block basis. This means that a grower must make decisions now about how to merge information collected on a per planting basis in order to report on a per acre, per farm/ranch basis in the Annual Compliance Form, calculate Nitrate Loading Risk, and determine annual nitrogen use.

14. To provide information in the Annual Compliance Form, calculate Nitrate Loading Risk and determine annual nitrogen use, the Conditional Waiver requires growers to identify nitrogen levels in soil, and in irrigation water for each specific crop and/or planting. This is not a simple determination in the Central Coast.

15. Central Coast agriculture is diverse. Some fresh fruit and vegetable growing operations have as many as thirty(30) different crops. I am aware of a single farm/ranch that grows as many as twelve (12) different crops. This complicates calculating Nitrate Loading Risk, Nitrogen Uptake Values, Nitrogen Balance Ratios, and creating and determining the effectiveness management practices as well as an INMP.

16. Soil types on the Central Coast are highly diverse as compared to many other parts of the United States. For example, I am aware of one grower who has as many as twenty-eight (28) soil types on his entire operations, and twelve (12) different soil types on one farm/ranch. Soil diversity will dilute the meaningfulness of Nitrate Loading Risk factors and Nitrogen Balance Ratios that do not take soil type into consideration, and will complicate the creation and determination of effectiveness of management practices and an INMP.

17. Many growers have plumbed their irrigation systems so that irrigation water from multiple wells may be moved throughout a growing area or farm/ranch in order to maximize water use flexibility. This is primarily safeguards a crop in the event that a single well is unable to

function. Consequently, many growers do not have a dedicated well or wells for each farm/ranch, and furthermore, they often blend well water from multiple wells. Therefore, irrigation water concentrations are not constant from day-to-day or crop-to-crop. It is currently unclear how to calculate the Nitrate Loading Risk or create a Nitrogen Balance Ratio when there is an implicit assumption that a well or wells are dedicated to a farm(s). Decisions need to be made today about how to deal with these complications in order to report meaningful data and to reduce expensive rework.

18. Fertilizer applications may be custom-applied, self-applied or fertigated (i.e., applied through the drip system). The significance of this is that sales, inventory, and application data must be captured from multiple vendors, from in-house fertilizer application crews and from irrigation personnel and this must be funneled into a data collection and processing system in order to report Annual Nitrate Use and to create and determine the effectiveness of the INMP.

19. Some vegetable plantings utilize as many as three (3) irrigation techniques at different times through the life of a crop. The Nitrate Loading Risk calculation defaults to the irrigation system perceived to present the greatest threat to groundwater quality. However, this default process inaccurately characterizes actual groundwater loading for purposes of determining the effectiveness of the INMP. This seemingly minor disconnect could influence today's data collection so that future calculations of actual nitrogen groundwater loading may not be feasible or may inaccurately overestimate actual loading rates.

20. There are endless number of combinations of nutrient budgets and nitrogen balance ratios when one considers the factors discussed above. For example, I recently calculated the number of possible nutrient budget permutations for four (4) Tier 3 ranches. I considered the number of plantings, different soil types, number of irrigation wells and the average number of fertilizer and irrigation applications across plantings. There was a range of 11,340 to 350,784 possible combinations of nutrient- and irrigation-related factors across the four (4) Tier 3 farms/ranches that would need to be considered in order to calculate and provide information specified in the Conditional Waiver.

21. Tree, vine or field crop operations are able to plan their fertilizer application and irrigations on a weekly or daily basis, whereas, fertilizer and irrigation plans for annual fresh fruit and vegetable growing operations shift multiple times a day to adjust for marketplace demands, weather, labor and other contingencies. According to database management vendors that I have talked with, perennial or field crop database platforms may be too rigid for the dynamics of vegetable production.

22. In an effort to try and assist my clients, I have had the opportunity to interview three (3) database software vendors on behalf of grower clients to discuss the viability and availability of data collection and management systems (i.e., databases). I also interviewed three (3) agronomists and the University of California Cooperative Extension to determine what tools they were developing and how or if these tools could be integrated into commercially available systems.

23. Traditionally, nutrient and irrigation issues have been addressed by specialists such as soil scientists dealing with fertility, and engineers or technicians dealing with irrigation. Many agronomic consultants have developed digital information systems (usually spreadsheet driven tools) to collect soil and water samples in order to make fertility recommendations. It is difficult to say what percent of agronomists include irrigation management information at this time; however, it may be the exception rather than the rule. At present, most agronomists assume their spreadsheet tools will integrate with commercially available database systems.

24. The UCCE has developed an Irrigation and Nutrient Management data management tool called CropManage for lettuce. This system takes UC technical information and creates simple algorithms that are combined with field specific information to provide decision-making recommendations to growers. This tool has been designed to allow acquisition of irrigation application information, weather data, evapotranspiration data, and nutrient sampling data on a real-time basis to facilitate rapid decision-making. UCCE is currently working on similar CropManage tools for Cole crops, hi-density leafy greens, caneberries, and strawberries. CropManage is free. The system can be easily imported into other data

management systems or integrated with moisture monitoring systems such as Climate minder or PureSense.

25. One San Joaquin Valley Consulting firm specializing in Dairy Nutrient Management approached me in 2011 about expanding their agronomic services to the Central Coast. I recently spoke to this firm about their current expansion plans. This firm is developing agronomic data collection systems. They have evaluated the Central Coast production systems and have determined that data collection challenges related to vegetable production systems exceed their capacity in the near and mid-term. Consequently, they are electing not to offer their services on the Central Coast until some time in the future when they have a database that is capable of dealing with production complexities. This vendor made a rough estimate of the range of costs associated with their current nutrient tracking system of $6-20.00/acre.

26. One commercial vendor presented their database services to two grower clients with whom I am working. One grower was a medium-sized broccoli grower and the other was a large, highly-diversified, cool-season vegetable grower. The rough estimate for providing the broccoli grower with data tracking system was about $6,000. This would include a nutrient and pesticide data collection system, creation of a few templates and limited technical support services. A database system to manage irrigation, nutrients and pesticides that would integrate with weather stations, moisture sensing systems, fertilizer applications, nutrient sampling data, input costing information, and inventory would cost about $10,000. The estimate is between $10-25.00 per acre for a medium sized, single cropped growing operation. The estimate for providing a database management system for a large, diversified operation was quoted between $50,000 - $125,000. Unfortunately, in this case, economies of scale do not apply. The larger and more complicated the operation, the more expensive the system is likely to be on a per acre basis. Both growers, regardless of size, are discussing whether to purchase and integrate these systems in phases, as the total price of the database is a potential obstacle. Please note that these estimates do not include the staff and infrastructure costs associated with modification of in-house accounting systems and/or current data collection processes to allow integration with the new database nor do the estimates include in-house staff and labor costs. It is likely that new

employees or contract labor will need to be added or existing staff may need to be cross-trained in order to capture and manage these data. This database system, regardless of cost, should be able to integrate with weather station data, moisture monitoring systems and accounting systems. This vendor is creating a field map driven system that would provide a geospatial component that is highly attractive to growers.

27. A fertilizer and pesticide vendor has created a database management system that appears to be closer to dealing with these complexities simply because this vendor is very familiar with vegetable and strawberry production and operational constraints. They made a presentation to a larger, highly diversified grower with whom I am working. This vendor is creating a field map driven system that would provide a geospatial component that is highly attractive to growers. One interesting question we are currently exploring is whether historical sales and application data may be included to create a nutrient and pesticide use baseline against which the grower can measure improvement. It appears, at present, historical data must be hand-entered, at considerable cost. At this time, this vendor does not have pricing information.

28. Finally, there is a one consulting company that has developed its own database system. The estimate for integrating nutrient and irrigation data to meet Tier 3 reporting criteria for a 500-acre vegetable grower is $68,000.00.

29. It is important to note, based on my conversations with vendors, it appears that most database system designers view field input from hand-held devices as a positive attribute. However, because of the current field labor shortages and below-average Internet technology capabilities of current field labor, it is imperative that database systems minimize the amount of input time from the field. This increases the costs for in-house data entry personnel.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 25th day of August 2012, at Paso Robles, California.

Kay Mercer

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BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File No. A-2209(b), (d) DECLARATION OF MARC LOS HUERTOS, PH.D., IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

I, Marc Los Huertos, Ph.D., declare as follows:

1. I am an associate professor of Environmental Science and Policy at California State University, Monterey Bay. Beginning with my graduate work at San Francisco State University in 1989, I have been working to understand and improve water quality in the state through an assortment of publicly funded research projects throughout the state. Most of my work has concentrated on testing various management practices to improve water quality in the Central Coast Region, with a particular interest in nitrogen biogeochemistry and management. I received my Ph.D. from University of California, Santa Cruz testing the role of native grasses to remove nitrate in a perched groundwater table. More recently, I have been testing various types of wetlands to remove nitrate from agricultural runoff and what their impact might be on greenhouse gas emissions and the potential to use managed aquifer recharge to improve water supplies. Through my research grants, I have become an important source of scientific information for the growers and resource agencies and train students to work in the region.

2. On March 15, 2012, the Central Coast Regional Water Quality Control Board (Central Coast Water Board) adopted Order No. R3-2012-0011 *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Conditional Waiver), Order No. R3-2012-0011-01 *Monitoring and Reporting Program for Tier 1 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 1 MRP), Order No. R3-2012-0011-02 *Monitoring and Reporting Program for Tier 2 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 2 MRP), and Order No. R3-2012-0011-03 *Monitoring and Reporting Program for Tier 3 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 3 MRP). (True and correct copies of these Orders were previously attached as Exhibits A, B, C, and D, respectively, to Grower-Shipper Association of Central California, Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties, and Western Growers' Petition for Review and Statement of Points and Authorities in Support Thereof (April 16, 2012).) I am familiar with the requirements contained in the Conditional Waiver, Tier 1 MRP, Tier 2 MRP, and Tier 3 MRP.

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3. Provision 44(g) of the Conditional Waiver requires growers, by October 1, 2012, to develop or update a farm water quality management plan (Farm Plan) that includes a description and results of methods used to verify practice effectiveness and compliance with the Conditional Waiver (e.g., water quality sampling, discharge characterization, reductions in pollutant loading).

4. It is my professional opinion that the Farm Plan is one of the most important documents that growers use to document what management practices have been implemented to improve water quality. Over the last 20 years, I have worked with individual growers and technical service providers in assisting growers to properly identify and implement management practices to improve water quality so that such practices could be properly documented in their Farm Plan. It is my professional opinion that the Farm Plans required under Resolution No. R3-2004-0117 (2004 Conditional Waiver) require personal and professional resources beyond the capacity in the Central Coast Region.

5. Provision 44(g) is a new provision and requirement for the Farm Plan that was not part of 2004 Conditional Waiver.

6. The Conditional Waiver does not define or explain what it means with respect to an individual grower's requirement to verify practice effectiveness and compliance with the Conditional Waiver. Based on my professional experience, the ability to verify practice effectiveness is a labor intensive and analytical lab intensive endeavor. In paragraphs 7 through 9 below, I outline the general scope of what this requirement means from the perspective of a water quality specialist such as myself.

7. Verifying the effectiveness of a practice means that one must be able to measure with enough accuracy and precision the potential pollutant load before and after the implementation of a practice. To effectively accomplish this, each practice would need to include a carefully designed sampling regime. Developing a sampling program to verify practices often requires a relatively sophisticated experimental design in order to detect water quality changes, which may not even be possible within the terms of the order. In many cases, water quality associated with nonpoint sources of pollution is highly variable. The sources of variation include

management activities, weather patterns, and ecological context (seasonality, land use, etc.). To verify practice, these sources of variability must be captured within the experimental design – or the results will be too variable (noisy) to interpret and make any conclusions. Thus, to verify a practice, the experimental design will also rely on a statistical analysis to interpret the data.

8. In general, an effective sampling design to capture sources of variation include replicated independent experimental units to be sampled. In laymen's terms, this means that each practice and a control (a section of the farm that does not have a practice installed) must be replicated several times. If a practice is implemented on a whole farm, there is no straightforward method to determine the effectiveness, because there is no control to use as a baseline. Although one might be tempted to compare practices across years (before and after a practice has been implemented), this violates assumptions in conventional statistics approaches even if there were replicates.

9. Thus, to accurately verify practice effectiveness, each grower would need to develop and implement a study design, and then conduct the statistical analysis of the results, which requires at minimum: graduate level statistics courses; and college course work with respect to field research methods focused on water quality. Typically, a qualified person to conduct such studies would be an individual with a Masters of Science degree, or more.

10. In the Central Coast Region, I am aware of few technical service providers that have the educational background and/or expertise in developing and implementing practice effectiveness studies. It is unlikely that existing resources in the Central Coast Region are available to assist growers in developing Farm Plans that include practice effectiveness verification.

11. Preparation of an experimental design to verify practice effectiveness typically takes an estimated 6 hours, depending on the professional expertise of the individual preparing the design.

12. To verify practice effectiveness, growers might need to sample runoff water on a weekly basis, which might require 8 hours per event with 2 people. Further, laboratory analysis

costs would vary based on the constituent or constituents being analyzed, but could cost an estimated $50-200+ per sample for each event.

13. For example, in 2010, I conducted a practice effectiveness study of vegetative treatment systems on three farms that cost over $100,000/year, where we found their effectiveness significantly lower than what is reported in the literature for reasons that we do not completely understand, thus requires more funding to evaluate these practices for the Central Coast.

14. As a practical matter, individual growers may implement one or more management practices that are designed to protect water quality. To verify the effectiveness of each practice, a separate evaluation for each practice would likely be necessary. To do this effectively, practices need to be implemented independent of each other (e.g., a multiway ANOVA (Analysis of Variance) design, or each practice needs to be implemented on different parts of the farm). In my work in the region, it takes cooperative growers substantial time and effort to change their operations to allow for these independent evaluations of a single management practice. Based on my experience, I believe that it would be nearly impossible to coordinate evaluations of multi-practices on a farm without substantially disrupting the farming activities.

15. Once the experimental design and sampling regime has been developed, the collection and chemical analysis of irrigation return flow must occur. Costs for sample collection and laboratory analysis may vary depending on the constituent or constituents of concern. Costs may also vary depending on the level of training and expertise required for the personnel collecting samples. For example, the evaluation of nutrients and pesticides require different collection procedures, handling, and analysis. Although personnel can be trained for each of these, the time and energy to learn these procedures may be significant. Based on my experience, collecting and analyzing these data require dedicated staff or professional consultants, and certified laboratories.

16. My research to date has largely been limited to evaluating practice effectiveness for nutrients from public funding sources and includes training students, thus costs may be lower than in private industry. Water quality sampling for nutrients is less expensive than water quality

sampling for other constituents such as toxicity and pesticides. Thus, my cost estimates in paragraph 17 associated with studies for nutrients are conservative.

17. Practice effectiveness studies may be multi-year projects because the performance varies dramatically between years. We generally sample weekly or twice a month, with additional sampling during storm events, depending on the practice to be evaluated. With 4 replicates, at 2 treatment locations (1 with and 1 without a practice), and 48 (26 samples/year x 2 treatments x 4 replicates) sampling dates, this would generate 208 samples. Based on the costs in my laboratory, which is probably low relative to commercial labs, the samples might require filtering ($5/sample) and then the analysis ($5 for pH, $5 for electrical conductivity, $30 for nutrients), for a rough estimate of $9,360. To be considered reliable, additional costs for quality control and quality assurance might cost another $1,000. The sample collection and transport to the lab might require 4 hours per event and at $15/hour this would cost $17,280. The analysis and reporting might be another $2,000 for an estimated $28,640 per year per practice. In general, to verify load reductions, discharge would also need to be measured, which would increase the event costs with another 4 hours of labor. In addition, if pesticides are being evaluated, then the costs will go up substantially.

18. Provision 72 of the Conditional Waiver, and Part 5 of the Tier 3 MRP collectively require growers with Tier 3 farms/ranches to conduct individual surface water discharge monitoring, and report individual surface water discharge monitoring results. (Conditional Waiver, p. 29; Tier 3 MRP, pp. 14-17.) The Tier 3 MRP requires that individual growers submit an individual surface water sampling and analysis plan and a Quality Assurance Project Plan by March 15, 2013. Individual surface water discharge monitoring is to include monitoring of irrigation runoff, tailwater discharges, discharges from tile drains, discharges from tailwater ponds, discharges from other surface water containment features, and stormwater discharges.

19. The stated purpose of the individual surface water discharge monitoring is to "a) evaluate the quality of individual waste discharges, including concentration and load of waste (in kilograms per day) for appropriate parameters, b) evaluate effects of waste discharge on water

quality and beneficial uses, and c) evaluate progress towards compliance with water quality improvement milestones in the Order." (Tier 3 MRP, p. 15.)

20. Based on my professional experience, individual surface water discharge monitoring will not meet the stated purpose of the Tier 3 MRP.

21. To evaluate the quality of waste discharge, the sampling regime must be adequate to capture the sources of variation that determine water quality. The Tier 3 MPR requires two or four sampling events per year (depending on the size of the farm and so-called conventional parameters). With this number of samples, the data will not be able to evaluate the water quality because the variation due to timing is not adequately represented. The sampling does not provide the data required to evaluate the effects on water quality or beneficial uses, except as a snapshot that is out of temporal context. In addition, to evaluate progress through time, growers must evaluate water quality using the same crops and variety from year-to-year with similar management technologies (irrigation types) and weather patterns for a decade or more to determine if they are making progress towards compliance relative to other sources of variation. In the context of some farming practices, where multiple crops are grown per year that vary based on market demand, weather, soil type, etc, I would be hard pressed to come up with a sampling design to capture these highly responsive and innovative farm operations.

22. The surface water discharge monitoring requirements are unlikely to meet the intended purpose of (1) demonstrating practice effectiveness, (2) characterizing discharge water quality, (3) prioritizing enforcement action, or (4) determining if there are trends, because of these goals require a sophisticated, well-designed monitoring program tailored to each farm that would resources that might exceed the farm profit margins.

23. Although not stated in the MRP, there is a belief that individual surface water discharge monitoring will provide public accountability because the data will be reported to the Central Coast Water Board. On the contrary, because the subset of growers submitting data has been determined arbitrarily (tiering based on size, proximity to impaired water bodies, etc), the data do not provide public accountability but provide the public with meaningless, unscientific data that cannot be used for any valid regulatory purpose.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 26th day of August 2012, at Seaside, California.

Marc Los Huertos, Ph.D.

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BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File No. A-2209(b), (d) DECLARATION OF LOWELL ZELINSKI IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

I, Lowell Zelinski, declare as follows:

1. I am the owner of Precision Ag Consulting, which provides agronomic and nutrient management consulting services to agriculture in the Central Coast Region and in the San Joaquin Valley. I have over 30 years of experience in the field of agricultural and soil sciences.

2. I have a Ph.D. in Soil Science with an emphasis in soil plant water relations from the University of California at Davis. Previously, I worked as a UC Extension Farm Advisor, and was the national agronomist for a large worldwide corporation.

3. I am familiar with Order No. R3-2012-0011 *Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Conditional Waiver), and Order Nos. R3-2012-0011-02 *Monitoring and Reporting Program for Tier 2 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 2 MRP), and R3-2012-0011-03 *Monitoring and Reporting Program for Tier 3 Dischargers Enrolled Under the Conditional Waiver of Waste Discharge Requirements for Discharges from Irrigated Lands* (Tier 3 MRP). (True and correct copies of these Orders were previously attached as Exhibits A, C, and D, respectively, to Grower-Shipper Association of Central California, Grower-Shipper Association of Santa Barbara and San Luis Obispo Counties, and Western Growers' Petition for Review and Statement of Points and Authorities in Support Thereof (April 16, 2012).) I am familiar with the requirements contained in the Conditional Waiver, Tier 2 MRP, and Tier 3 MRP.

Backflow Prevention Devices

4. I understand that the Conditional Waiver requires growers to install and maintain approved backflow prevention devices, and provide proof of proper backflow prevention devices by October 1, 2012. (Conditional Waiver, pp. 19-20; Tier 2 MRP, p. 13; Tier 3 MRP, p. 13.)

5. The Conditional Waiver broadens the scope of regulations regarding Backflow Prevention Devices (BPD) to not only include a requirement for chemigation (the injection of pesticides into an irrigation system), but also to include fertigation (the injection of fertilizers into an irrigation system).

6. For most farmers, chemigation is relatively infrequent, as there are not many pesticides that are formulated to allow injection into an irrigation system. This, however, is not true for fertigation, where almost any liquid fertilizer can be injected into an irrigation system. Prior to October 1, 2012, many well locations did not require BPD on wells used for fertigation. Consequently there will be a large number of wells that will have to be retrofitted.

7. The precise requirements for a fertigation BPD are not known, and a recent update by the Central Coast Water Board was not helpful in clarifying the requirement:

> In the case of fertigation, local agencies may have specific requirements. In the absence of local requirements, the type of backflow prevention device necessary is dependent on the well construction, irrigation system, and the type of hazards and uses. (See Central Coast Water Board, August 13, 2012, document titled, *Agricultural Regulatory Program Resources For Growers Backflow Prevention Devices*, attached hereto as Exhibit 1.)

8. There are dozens of potential combinations of irrigation system equipment that could be construed as complete, or components of, BPD. If the fertigation requirements were the same as the chemigation requirements, there would at least be some clarity but currently a farmer does not know if the fertigation requirements will be less, the same, or more than the chemigation requirements.

9. The fertigation requirement may be as simple as a single check valve ($20 to $500 depending on size), to as complex as a chemigation valve with electrical interties between chemical pump and irrigation pump, with additional backflow or air valves and low pressure drains on the chemical supply side ($100 to $1,000s, depending on size). The installation of these more sophisticated units is typically beyond the technical ability of most farmers, and therefore they would need to contract with a well company for installation.

10. Finally, components of BPD fit inline, usually between the well outlet and a filtration station. Many well systems do not have adequate space to easily insert a BPD in the pipe, and, there, the design of a "horseshoe" to increase this distance and/or the rotation of the well discharge may be required. For larger pipes, which are frequently steel, this would require cutting and welding various flanges and elbows at the pump site. These skills are beyond the ability of many farmers and again they would need to contract with a well company for this work.

Nitrate (NO3) and Irrigation Management Components

11. Fertilizer and irrigation management are two of the most complex farm management inputs that farmers can control. They are complex in part because they interact with other inputs and are closely tied to the yield and quality of the final product.

12. Fertilizer use and irrigation management are also closely tied to both profitability and being good stewards of the environment. To add to the complexity, both under-applications and over-applications of fertilizer and water can reduce the yields and quality of the farm products and thus affect profitability. Farmers constantly face the questions of when and how much when it comes to irrigation and, in addition, the question of what type also comes into play when considering nutrients.

13. Finally – salinity management is tied to nutrient and irrigation management. All irrigated agriculture must deal with salt accumulation in the root zone of the crops they grow as it is an inevitable consequence of applying irrigation water. There are salts in the water that are left behind after plants absorb water for transpiration. The only effective way of coping with the increase in salinity is through the application of excess water to leach the salts from the root zone. The science of this is well known, and formulas exist to determine the necessary "leaching fraction" that must be applied to maintain a non-yield limiting level of salinity in the soil.

Determination of Nitrate Hazard Index:

14. There are two proposed methods for determining NO3 leaching hazard, with neither being my preferred or recommended choice. The first question that arises is which method a farmer should adopt.

Method 1 - table 4 in tier 2 and 3 requirements:

15. This method of determining the nitrate loading risk factor has many issues that affect its ability to predict nitrate-loading risk. Most importantly, there is no soil component in this method. Soil type can pay a major role in determining the ultimate fate of applied nitrogen, as it influences leaching potential as well as runoff and denitrification. The method does not consider management of the irrigation system, just their use. Many ranches have more than one source of irrigation water, which may or may not have different levels of nitrate. If this condition

exists, a ranch could be in the high range when using one source and in the low range when using another.

16. There is no consideration as to the form of nitrogen applied and/or time of year for application. Ammonium and/or slow release forms of N applied are not as susceptible to leaching as NO3 forms. Although there is a conversion to NO3 from either of the two previous forms, this conversion is a biological process that is very dependent on soil temperature.

Method 2 – University of California Division of Agriculture and Natural Resources (UCANR) NO3 Hazard Index:

17. The addition of a soils component is beneficial, but in actual use, the selection of soil type by simply selecting a soil series from the drop down list does not capture the reality of the field situation. The Conditional Waiver recognizes this, stating that variability in soils occurs in fields, but the Conditional Waiver does not say how to deal with the variability.

18. Soils series and Natural Resource Conservation Service (NRCS) mapping are too generalized to make the determination of risk in actual field situations. If you read a description of a soil-mapping unit, it specifically states that there are "inclusions" of other soils within the mapping unit. The Conditional Waiver does not indicate if a grower is required to precisely determine the "actual" soil series in his/her field.

19. The crop component is also based on hypothetical considerations and not actually based on field studies. It is primarily concerned with the potential for the crop to remove some fraction of applied nitrogen, but states that there are no formulas or equations used. There is good reason for this, because the information on N removal by most crops (especially vegetables in region 3) has not been studied. The determination of crop risk appears to be the opinion of the authors of the index.

20. The irrigation component is also highly simplistic, and thus does not take into consideration distribution uniformity, potential winter rainfall as a source of water, or the fact that more than one method is frequently employed in the production of crops.

Annual Compliance Form

21. The Conditional Waiver requires Tiers 2 and Tier 3 growers to submit an Annual Compliance Form. As part of the Annual Compliance Form, Tier 2 and Tier 3 growers that have farms/ranches with High Nitrate Loading Risk are required to report total nitrogen applied per acre to each farm/ranch or nitrate loading risk unit, including, but not limited to, organic and inorganic fertilizers, slow release products, compost, compost teas, manure, extracts, nitrogen present in the soil, and nitrate in irrigation water. Further, the irrigation and nutrient management plan requirement for Tier 3 growers requires record keeping of the total nitrogen applied per crop, per acre to each farm/ranch or nitrate loading risk unit (…) including, but not limited to, organic and inorganic fertilizers, slow release products, compost, compost teas, manure, extracts, nitrogen present in the soil, and nitrate in irrigation water. For the Annual Compliance Form, reporting of these requirements is not required until October 1, 2014; however, it is my belief that growers will need to start documenting this information in 2013 in order to submit the information to comply with the October 1, 2014 deadline. It does not appear that the Conditional Waiver anticipates the complexity of collecting such data, or the volume of data that this requirement will generate.

22. For example, a moderately size vegetable grower in the Salinas Valley may plant the same acre numerous times per year with numerous different crops. Within a block or field, there may be more than one crop planted and/or the crops may be managed in such a way that irrigation and nitrogen management varies, just within the one field. The Conditional Waiver seems to require that all of the practices be recorded and reported to the Central Coast Water Board.

23. As an example, one farmer with whom I consult farms about 8,000 acres of vegetables in the Salinas Valley. Each acre is planted an average of 2.5 times each year, leading to about 20,000 crop-acres per year. On each of those acres, 3 to 4 fertilizer applications are made in addition to cover crop additions and potential compost additions. If there are 5 potential additions of materials, which may contain nitrogen (not including irrigation water), there would be 100,000 events that need to be calculated to comply with the Conditional Waiver.

Additionally, if we expand this example to include irrigation events, typically 5 per crop, we now have 500,000 events to report on – for just this one farm.

24. My consulting fees to assist this grower, which are exclusive of any of the actual work which would need to be done in order to comply, is approximately $30,000 per year. My cost is estimated based on me spending eight hours per week to help the grower to comply with these requirement, and others.

25. An additional example of costs associated with complying would be soil sampling prior to planting to determine residual soil nitrogen levels. This is just one component of complying and does not satisfy all the requirements. With the farmer example above, it is indicated that they have approximately 20,000 plantings per year. According to the Conditional Waiver, a soil sample needs to be taken prior to each of these plantings. The cost of collecting, analyzing, interpreting and summarizing this information is conservatively estimated at $100.00 per sample. Therefore the cost of just this one component of the Condition Waiver for this grower is estimated to be $2,000,000.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this 25 day of August 2012, at Paso Robles, California.

Lowell Zelinski

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BEFORE THE

CALIFORNIA STATE WATER RESOURCES CONTROL BOARD

In the Matter of the Requests for Stay of Petitioners California Farm Bureau Federation; Monterey County Farm Bureau; San Benito County Farm Bureau; San Luis Obispo County Farm Bureau; San Mateo County Farm Bureau; Santa Barbara County Farm Bureau; Santa Clara County Farm Bureau; and Santa Cruz County Farm Bureau; Ocean Mist Farms; RC Farms; Grower-Shipper Association of Central California; Grower-Shipper Association of San Luis Obispo and Santa Barbara Counties; Western Growers; Jensen Family Farms, Inc.; and William Elliott.	SWRCB/OCC File Nos. A-2209(b), (d) **PROOF OF SERVICE** SWRCB Public Hearing Date: August 30, 2012 Time: 9:30 a.m.

I am employed in the County of Sacramento; my business address is 500 Capitol Mall, Suite 1000, Sacramento, California; I am over the age of 18 years and not a party to the foregoing action.

On August 27, 2012, I served a true and correct copy of the following documents:

1. PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST;

2. PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S WITNESS LIST FOR STATE WATER BOARD'S AUGUST 30, 2012 PUBLIC HEARING ON STAY REQUESTS;

3. DECLARATION OF BOB CAMPBELL IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST;

4. DECLARATION OF STEPHEN L. CLARK IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST;

5. DECLARATION OF DIRK GIANNINI IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST;

6. DECLARATION OF LAWRENCE GRICE IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST;

7. DECLARATION OF MICHAEL L. JOHNSON IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST;

8. DECLARATION OF MARC LOS HUERTOS, PH.D., IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST;

9. DECLARATION OF KAY MERCER IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST; and

10. DECLARATION OF LOWELL ZELINSKI IN SUPPORT OF PETITIONERS CALIFORNIA FARM BUREAU FEDERATION, ET AL. AND GROWER-SHIPPER ASSOCIATION OF CENTRAL CALIFORNIA, ET AL.'S RESPONSE TO STATE WATER BOARD'S NOTICE OF PUBLIC HEARING ON STAY REQUEST

XXX By electronically transmitting the documents to the persons at the electronic mailing addresses as set forth in the attached Service List.

I declare under penalty of perjury that the foregoing is true and correct. Executed on August 27, 2012, at Sacramento, California.

Crystal Rivera

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Re: August 2012

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SWRCB/OCC Files A-2209(a)-(e)

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